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ABSTRACT

The manual is designed to help teachers develop effective and efficient individual educational plans for severely handicapped children. Initial sections explain the four major parts of educational programing (short- and long-term objectives, an instructional plan, and a means of monitoring progress) and the importance of a problem-oriented system. Subsequent sections address the following topics (sample subtopics in parentheses): selecting programing dimensions (instructional domains), determining programing objectives, motivating behavior (functional versus contrived consequences), selecting specific programing targets (maintaining behavior), and programing learning activities (flowcharting instructions). Also addressed are such programing components as the test-teach system, strong inference testing, data-based decision making, and classroom organization. Appended are sample sheets for recording various data. (SW)

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# INDIVIDUALIZED EDUCATIONAL PROGRAMMING

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# INTRODUCTION

The purpose of this manual is to help teachers of the severely handicapped child develop effective and efficient individual educational plans. This is not an easy task, since the students to be served have only recently become eligible for public educational services and we are still in the early stages of defining appropriate curriculums and methods for measuring progress. In addition, the primary approach to the education of the severely handicapped is essentially a one-on-one instructional model. This is necessary, since none of these students can respond to written directions, and the majority cannot respond appropriately to even the most basic verbal instructions. In most instances, the children have to be physically guided through the actions that they are required to make and this guidance has to be very precise for the children to understand what is expected of them. They need more praise and other motivational support than most other students because the majority of these children have experienced few successes and almost everything that they have needed in their daily lives has been provided for them by parents and other caretakers. They have not learned to do things on their own and often find such activities difficult and sometimes even painful. Finally, the areas of learning that are most appropriate for these children have not been commonly considered in public education. To teach a child to go to the toilet, to feed himself, to walk without support, to begin basic communication with others, to use his hands more effectively, and to learn that what he does can influence what happens to him are forms of behavior that the overwhelming number of elementary and even special education teachers expect children to have mastered before beginning school. This is the "bottom line" of education and those of us who attempt to perform our profession with these students are the pioneers.

A description in somewhat general terms about the diverse nature of the children who are called the severely handicapped is very much in order here. These children do not form a clear homogeneous group. Many of the children have some form of cerebral palsy that prevents them from using their body in an effective way. Some cannot move their arms or legs at all, while others can move their bodies in only uncoordinated and often frustrating ways. Other children in the group are proficient in the motor domain, but for unknown reasons have not formed positive social relationships with their parents, isolate themselves from others, and may engage in long sequences of self-stimulating behaviors, sometimes including self-injurious responses. These are the severely emotionally disturbed or the autistic-like children whose basic problem is often associated with the complete absence of communication processes. Still other children may have problems with vision and hearing in conjunction with a motor deficiency, so they are considered to be multiply handicapped. Some children have experienced brain damage due to disease, physical accidents, or a poison, and are generally unresponsive to the events that are happening around them, while others have come to behave in this manner due to drugs that have been used to control their seizures. With all of these children, their level of intellectual functioning is unknown, partly because they have rarely been instructed in a systematic

manner and partly due to the lack of an effective means for assessing them. So while they appear to have very low levels of cognitive or intellectual abilities at first glance, one would be making an important mistake to hold this assumption. The children will be better served if we assume that they understand more than they can express in the way of emotional reactions, communication, and the feeling of need for some types of stimulation and assistance.

What we need to do as teachers of these children is to provide the most precise form of instruction ever presented to any child in a school setting and to do so with all the warmth and enthusiasm that we can muster. While society in general may consider such children as the ultimate tragedy of the human condition, the children who experience these traumatic conditions of existence did not wish it on themselves and they are relatively helpless in doing anything about it. However, none of these children is without hope because we have available to us a tremendous variety of means for assisting these children to learn through precise instruction; to make it easier for them to move and to communicate through the use of prosthetic equipment such as special chairs, braces, counter-balanced arm supports, language boards, and even electronic feedback devices; and, finally, to engineer environments that are relatively free of barriers which could prevent learning or carrying out an effective action. The individual educational plans that are described in this manual are an attempt to bring the very best and the most precise instruction possible into service for these children. Each teacher of the severely handicapped will be asked to give more than the average teacher in performing the educational mission, but these children need much more than the average if they are to benefit from instruction. What we know at the beginning is that the vast majority of these children <u>can</u> benefit from instruction if it is done properly.

## EDUCATIONAL PROGRAMMING

An individual educational plan generally consists of four major parts. These are a set of long-term goals which lead to a defined set of short-term objectives, a definite instructional plan, and a means for monitoring a child's progress in each area that is selected for insruction. Some of these objectives, such as teaching the child to manipulate objects manually, to walk unassisted, or to eat without help, are relatively obvious, while others such as learning to be intentional, imitative, responsive to consequences, conceptual, and vocally intelligible, are not. Program areas such as these are selected not because they are familiar or unfamiliar, but because they are the basic structures from which a child learns to care for his own needs to some extent, to socialize with other children and adults, to communicate needs to others, and to engage in activities that are personally interesting and, hopefully in some cases, productive for the society in which we would want any person to live. A student needs manipulative skills, hand-eye coordination, imitative abilities, vocal responses, functional concepts, and an intentional capability to be able to and to want to engage in these socially defined activities. If we can teach the more fundamental skills, then the child or adolescent can learn the more general activities that are part of regular education and human socialization - but without the

fundamentals, the student is doomed to failure. What we are attempting to say here is that some of the objectives that are described may not seem important initially or seem strange in the context of public education. However, we will try in every case to show you why each objective is an important consideration in the education of the more severely handicapped.

The system used in this manual moves sequentially from screening the child for educational deficiencies in each of a number of major dimensions and then establishing long-term goals based on assessed needs. These goals are then divided into a sequence of short-term objectives that involve what we choose to call acceleration targets, deceleration targets, and maintenance targets. The acceleration targets are those forms of behavior that we want the child to acquire as an outcome of instruction. Deceleration targets are forms of behavior emitted by the child such as self-injury, self-stimulation, aggression, inattention or other disruptive modes of behavior that we would want to eliminate in the process of instruction. The maintenance targets are those forms of behavior that have been taught to the child such as toileting, self-feeding, and mobility, that may need continuing social attention if the child is not to lose these important developments. Having selected specific instructional objectives, the next step is to outline an explicit instructional plan which we suggest be put in the format of a flowchart which contains provisions for presenting materials, evaluating the response of the child, providing appropriate motivating consequences, and also anticipating the alternatives when the child does not do what is asked of him and does something else instead. Examples of other formats will also be described.

Once a plan is devised, the method for evaluating and recording progress must be selected so that objective assessments of the child's progress in relation to a selected target of behavior may be made. It is these objective assessments which allow the teacher, therapist, or other programmer to determine the extent to which the instructional plan is working and to modify plans which are not effective in teaching targeted skills to students with severe handicapping conditions. The remainder of this manual contains specific information on how programming is done within the problem-oriented system being proposed here.

## PROBLEM-ORIENTED SYSTEM

The individual educational planning system suggested here is one which focuses on identifying those areas where a child needs instruction, implementing that instruction, and evaluating the extent to which the instructional process assists a child to acquire skills in those targeted instructional areas. The system is interdisciplinary in structure and requires the expertise of medical, therapeutic, and educational programmers to tackle and solve problems typically demonstrated by handicapped learners. The most efficient implementation of the system utilizes a series of cards (6" x 8") or regular sized sheets of paper on which the major dimensions of programming are represented. An overview of the information included in each component of the system and how that information fits into the interdisciplinary programming model suggested here is included in this

module. Detailed instructions for how to complete each component in the series is outlined in A Problem-Oriented Approach to Individual Educational Planning: Instructions for Using the Card Format (Bricker & Campbell, 1979).

The importance of the problem-oriented perspective, however, is not the utilization of a particular card system or specific written formats. Many school districts and agencies have developed effective written systems for formulating goals, describing intervention methods, and measuring progress. A number of additional approaches are included as references at the end of this module. Rather, the problem-oriented system has at its roots, the systematic solution of student learning needs through combining forms of methodology that produce change in the behavior of the student. As such, the product of the problem-oriented system is improvement in child performance as a function of activities engaged in by the student in school, at home, and in the community. Therefore, the approach can be used by teachers, therapists, parents, and others responsible for student instruction in combination with whatever administrative systems are already in place for writing an IEP, describing instructional methods, and documenting student progress.

## SELECTING PROGRAMMING DIMENSIONS

### Precautionary Information

One of the first dimensions that we want to consider is the health and safety of the child. Since all schools require some for of medical information about a student, we will generally have up to date information about medical concerns. Parents are quite willing to check this information and also supplement it in a number of different recorded concerns or precautions. The emergency referral information must be as complete and correct as humanly possible. This information should be checked at regular intervals and information recorded carefully to avoid any possible confusion. Major medical problems, including tendency to seizures and all allergies should be listed on this form along with what to do if a problem does arise.

The precautionary information (see Figure 1 for example) is extremely important to you and to everyone else who may come into contact with the child. Since the great majority of these children cannot talk or even signal their concerns, we need more than the usual information from the medical records and from the parents. Note that one of the first precautions pertains to epileptic seizures which are generally divided into gran mal and petit mal types. The frequency could vary from several each day to fewer than one every several months, but the frequency noted should be from recent dated records and then revised as parents and teachers do a more systematic count if seizures continue to occur. The final item pertaining to seizures is the management plan if the child has one - what steps are taken immediately? Is anyone notified? Does the school require notation on an incident report? If the plan for management contains anything special, then any person who happens to be alone with the child should be informed beforehand. Another section pertains to allergies and would include information on diabetes, as well as allergic responses to foods, fluids,

Figure #1

Sample Precautionary Information Record

PRECAUTIONARY INFORMATION

DATE: _____

STUDENT'S NAME: _____ D.O.B.: _____

ADDRESS: _____ PHONE: _____

PARENT'S NAMES: _____

PERSON TO BE CONTACTED IN EMERGENCY: _____ PHONE: _____

**********

Current Medications: _____

Medication Change? _____

_____ Date: _____

Medication Change? _____

Date: _____

**********

Seizures? Type/Frequency/Duration: _____

_____

Management Plan: _____

**********

Allergies? Food: _____

Other: _____

**********

Behavior Requiring Precautions? Type: _____

Management Plan: _____

Type: _____

Management Plan: _____

materials, and especially to drugs in the event of an accident requiring immediate medical attention. Other precautions include such factors as a child's tendency to bite, kick, or hit either another child or an adult. This is not an uncommon occurrence with some children who are classified as severely handicapped. Other children may be self-injurious, some tend to drink or eat anything that will fit into their mouths, while still others may hold their breath when frustrated in some way. Each of these factors should be noted when true of a given child and then each should be followed by a sufficiently explanatory classroom management plan that a relative stranger would know what to do in the event of an incident. When complete, the information sheet should be checked with the parents and others who may know the child to determine that it is complete (according to all available information) and the management plans appropriate. This information sheet should be routinely checked and updated as new precautions come into the picture.

## Assessment Information

A summary sheet (see Figure 2 for example), which contains all available information on the assessment history of the child, is next in the sequence. This information is considered "privileged" in the sense that only those professionals who need to know have access to the information. However, parents do have the right to see the records and you should check with your administrator concerning the methods used to give this information to the parents when it is requested. In addition, one is on safe ground if the parents are asked for permission to show the information to a new person such as a practicum student or a student teacher who will be working with the child. When severely handicapped children are brought into the school system for the first time, the information on their hearing and vision is often grossly incomplete. Since these children are difficult or impossible to test using conventional procedures, most of the records are based on casual and subjective observations. When this is found to be the case, the teacher should schedule the child for a more objective evaluation as soon as possible, since much of the instruction given to these children is based on their ability to hear and see at a normal level or else major modifications are made in the instructional procedure. Most audiologists should know something about tangible reinforcement operant conditioning audiometry, tympanic membrane assessment, or some other variety that can be used with non-verbal severely handicapped children. In addition, the school system should have contact with an opthalmologist who will do a visual check of the child. If the child does have hearing or vision problems, then the first line of defense is to determine if any corrections through hearing aides or eyeglasses can be made to improve the ability of the child to use his senses. The parents should be active partners in determining this and in seeking professional help. However, as mentioned in the manual, Motivating Behavioral Change (Bricker & Campbell, 1982), there are techniques that can be used to motivate a child in both the assessment phase of sensory evaluation, as well as in motivating the child to wear the required sensory aides. At times a teacher or parent may be asked to assist the audiologist or ophthalmologist and such motivation techniques may be very useful.

Figure #2

Sample Assessment Information Record

ASSESSMENT RECORD

DATE: _____

STUDENT'S NAME: _____ D.O.B. _____

| | Requested | Completed | Recommendations |
|---|---|---|---|
| **Medical Evaluations:** | | | |
| Entrance Form | _____ | _____ | _____ |
| Orthopedics | _____ | _____ | _____ |
| Neurology | _____ | _____ | _____ |
| Other: | | | |
| **Sensory Evaluations:** | | | |
| Vision Screening (Pass/Fail) | _____ | _____ | _____ |
| Functional Vision | _____ | _____ | _____ |
| Medical Examination? | _____ | _____ | _____ |
| Correction? _____ | | Programming? _____ | |
| Hearning Screening (Pass/Fail) | _____ | _____ | _____ |
| Medical Examination? | _____ | _____ | _____ |
| Correction? _____ | | Programming? _____ | |
| **Movement Evaluations:** | | | |
| Physical Therapy | _____ | _____ | _____ |
| Occupational Therapy | _____ | _____ | _____ |
| Adaptive Physical Ed. | | | |
| Psychological Evaluation | _____ | _____ | _____ |
| Speech/Language | _____ | _____ | _____ |
| Other: _____ | _____ | _____ | _____ |

Several areas of assessment are extremely valuable for the severely handicapped child and the child's teacher. The great majority of these children have some form of motor development problem that will affect their response to education. Consequently, the teacher should request an evaluation by occupational and physical therapy as soon as possible. Hopefully, the children in your particular setting are given such evaluations on a routine basis and this should be noted in the assessment summary. Any previous assessment of this type should also be noted along with the general outcome of the evaluation. Dates that such assessments were scheduled should be noted, along with dates when they are completed. This allows the teacher to review the degree to which correct information is being used to develop and revise the individual educational plan. If we are using visual stimuli in a language training activity and we still know nothing about the child's ability to see clearly, then we may well be wasting a large amount of time. Psychological tests dealing primarily with the domain of intelligence should be evaluated cautiously when used with this group of children. Few tests are truly responsive to the problems that these children have in letting others know how much they comprehend or can do given proper equipment, motivation, and other assistance including sensory aides for hearing and vision. Often a psychologist will lack the same information as the teacher concerning vision, hearing, motoric competence, or motivation of the child, all of which can mask the level of true achievement attainable by the child. Consequently, results from such testing should be interpreted only in combination with teacher constructed criterion referenced tests or baseline performance measurements to establish a better perspective about the child's ability.

The information discussed thus far deals primarily with health and health related aspects that can have a tremendous bearing on the long-term objectives that you set for each of your students and on the methods that you propose for teaching them important skills. Knowing how well the child can see or hear is critical to the educational process and knowing about allergies and other health related factors puts the teacher in safer interaction with the child and with the parents. Unusual circumstances will undoubtedly occur and will need special notation and special management. For example, a child's physician may indicate that a child may be prone to heart failure under conditions of stress or the child has brittle bones or may easily break a bone because of the lack of sensation below the waist. One alternative is not to bring the child to school, but to provide home-based instruction. This tendency is being rejected by many educators of the severely handicapped because they view the isolation from peers to be potentially more damaging than the risk of even such important matters as cardiac or respiratory distress. This is also true in seizure control in that the amount of a control drug necessary to completely control the seizures may seriously interfere with learning and a compromise may often be reached with physicians and parents so that the possibility of a seizure is tolerated in order to have the child receptive to instruction. In all of these more sensitive areas the primary consideration should be the long-term benefit to the student. We feel that the more normal situation of sending a child to school with peers is important to both the student and to his parents, even though this may involve some degree of risk. You will find that if such decisions are negotiated carefully with parents, physicians, and administrators in the school system, that agreements can be reached that are

in the best interest of the students and do not put the teacher in jeopardy for legal action in the event of a problem that takes place in the school. In most instances, what happens in school could just as easily happen at home in the negative sense, but the home cannot duplicate the equipment, excitement, and potentials for improved learning that can take place at school. With such considerations in hand, the next step in formulating an individual educational plan is to move to the more typical domains of school activity.

Instructional Domains

There are a variety of ways in which programming domains are established for severely handicapped students. The most common, but also the least effective, way is to identify instructional domains on the basis of ages/stages developmental sequences. This type of an approach would yield curriculum domains such as gross motor, fine motor, personal-social, and adaptive behavior which might be expanded into more refined domains such as self-care, language, cognitive, or other breakdowns of major areas of behavior. Identifying instructional domains on the basis of a normal sequence of skill development would be referred to as a bottom-up approach where the expectation is that students will acquire the same skills learned by normally developing children.

More recently, a top-down approach to curriculum for severely handicapped students has been advocated (see, for instance, Brown & others, 1981). Instructional domains that will be relevant for student functioning in the adult years are based as the basis for identification of learning objectives. Such areas as community mobility, vocational skills, leisure/recreation competence, and domestic living abilities and other adult-centered domains emerge from this type of an approach. Many severely handicapped students have so many different handicapping problems (e.g., deaf, blind, motorically limited, etc.), that teachers and other programmers have difficulty resolving a top-down approach to curriculum for those students. Many severely handicapped students may never ride a public bus independently. However, all severely handicapped people need to be as mobile as possible within the community. For some students, mobility might mean being able to independently move themselves around the work environment and/or transfer in and out of a car independently or even to be able to indicate to what location they would like to be moved. The point in the top-down approach to curriculum is for programmers to recognize that ultimate skills must be taught to whatever extent possible.

The most severely multihandicapped students are, of course, the most difficult individuals for whom to identify instructional domains that will lead to independent functioning. However, a "rule" developed by Lou Brown at the University of Wisconsin is one that teachers/programmers can apply when developing specific instructional content for even the most severely multihandicapped student. The "rule" helps all of us to remember to program for students in ways that are relevant by asking one simple question -- "If the student doesn't perform the desired response, does the adult have to?" If the student can't even indicate to what location s/he would like to be moved or to move to that place independently, an adult will have to move the

student. An adult must change a student's diapers if the student is not toilet trained and feed when independent eating is not present. However, the adult does not have to shake the rattle if the student doesn't or babble if the student does not or turn to sound when the student doesn't demonstrate this response. All instructional domains (and activities within those domains) should be evaluated in terms of this simple question for every student who is severely handicapped. Irrelevant activities should be eliminated whether those activities represent instructional domains derived from either a bottom-up or top-down approach. Every task taught to a severely handicapped student should lead to an adult-relevant skill.

The Index of Qualification for Specialized Services (Bricker & Campbell, 1980; Campbell & Bricker, 1982) provides an alternative for identifying instructional domains, particularly for severely multi-handicapped students. The Index includes domains that relate to processes necessary to program for ultimate adult functioning and allows for the development of highly individualized programming when used in conjunction with a top-down approach to curriculum. Domains such as tonicity, visual and auditory skills, allow the programmer to develop instructional objectives that will bypass and strengthen responses in the student's deficient areas. For instance, a student with visual impairment might simultaneously have objectives designed to enhance residual vision while also learning to locate an object in front of the student for incorporation into vocational or leisure/recreation or domestic skills. A general model for intervention which depicts each of the dimensions included on the Index is presented in Figure 3.

Selection of instructional domains, regardless of the method used for selection, forms the first step in designing the individual education plan (IEP) or the individual habilitation plan (IHP). The specific instructional activities to be engaged in by the student, both in the classroom and through related services such as the therapies will be derived from domains selected as the representative of the most important and relevant learning needs.

## DETERMINING PROGRAMMING OBJECTIVES

A long-term goal is one that can reasonably be accomplished during the period of one school year. As such, a long-term goal is determined by the child's rate of achievement. When a child enters school for the first time, descriptions of long-term goals are generally guesses, since there is no basis for projecting how much the child will or can learn in a given period. These guesses are not random, however, since they can be based on how much the child has learned thus far and the conditions of instruction that have been provided by the parents and others during past years. This brings us to an important first principle. The parent is the best initial and continuing source of information concerning our education effectiveness. Parents and guardians of the more severely handicapped are generally super-sensitive observers of their children's behavior and development. They look hopefully for the smallest sign of progress and are generally willing to talk at length about what they feel their child understands or can do. By using the parents as an important source of information, we are taking a significant first step

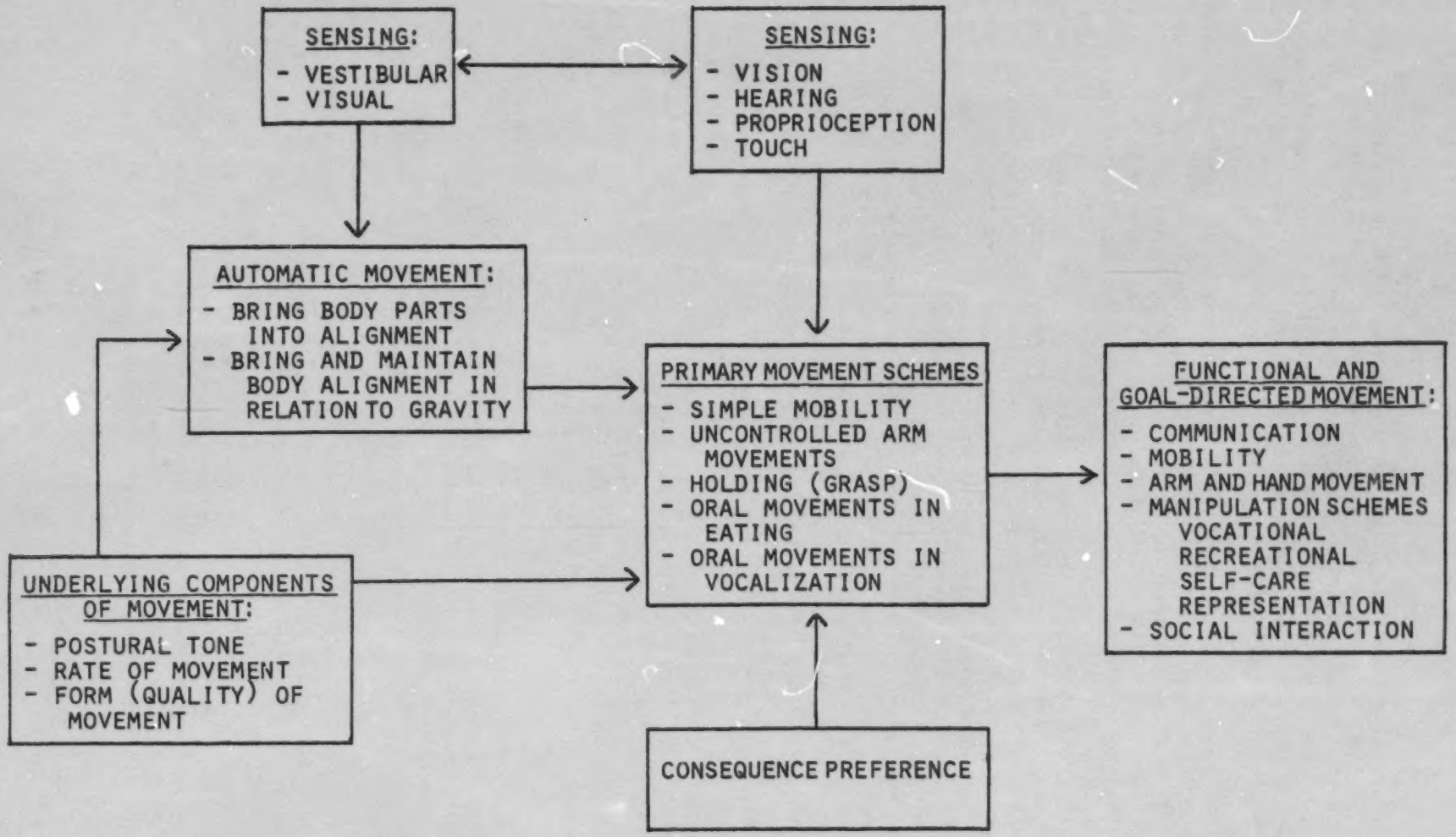


Figure #3

MODEL OF INTERVENTION FOR CHILDREN WITH MOTOR IMPAIRMENTS

toward bringing them into partnership with us, which is a mutually beneficial relationship and one that serves the child best. A phone call or a conversation that is guided in part by an outline of the dimensions of behavior that need to be discussed and methods for recording the information given by the parents will often serve as the first step in identifying the initial set of long-term goals.

In some programs for the severely handicapped, teachers use either a commercially available assessment/curriculum guide or one which has been devised within the program. These guides usually contain lists of behavior which have been classified into domains such as self-care, gross motor, language, and cognitive skills. When an assessment/curriculum device is used to determine long range goals, the goals identified are those from the checklist of behavior which the child was unable to demonstrate during the assessment process rather than those goals which can be reasonably accomplished during a school year. In other words, assessment/curriculum devices "produce" long-term goals without regard to the child's previously known rate of acquisition. This phenomena accounts in part for the lack of skill acquisition frequently found on individual education plans developed for severely handicapped children, as well as the carrying over of unachieved objectives from quarter to quarter or from one school year into the next. Our point here and one that we will return to again in this module is that knowledge of the child's rate of acquisition of selected skills is critical in establishing long-term goals and in developing the means that will be used to assist the child to achieve those objective at the fastest rate possible.

Rate of acquisition is only one factor in selecting programming objectives. A second factor is the content of those objectives. Assessment/curriculum checklists generally order the skills selected for inclusion on that checklist according to the sequence by which normally developing children demonstrate those skills. For instance, behavior generally included under the category or domain of gross motor starts with simple skills such as controlling head movements and moves through sitting, crawling, and into more complex skills such as walking and running. The sequence is the one in which normally developing children emit more complex forms of motor behavior. The implications are that atypically developing children need to demonstrate <u>all</u> of those skills <u>in the same</u> order as normally developing children <u>and</u> that the critical difference between the so-called normal and atypical child is that the atypical child will show a slower rate of acquisition. Such structure, again, assumes that a teacher should start at the bottom of a skill sequence and work up (or forward chain).

This brings us to a different concept of programming. We would generally discourage the selection of programming objectives that are ends in themselves. If we decide to teach the child to select colors that are named or to match colors in some way, then we should have some concept of how this skill would be used in a more general way. Simply learning the names of colors is not useful in any long-term sense--think for a moment when you need to know your colors as an adult and you may quickly recognize that most adult acts of this type depend on coordinating colors rather than matching them. We select clothes that are color coordinated, furniture that coordinates with

the carpet, and even foods that have color contrasts. Whenever we select an educational target or objective, we must consider how it will be used ultimately in terms of helping the child live with reasonable success in the normal adult community. Pointing to named objects may have a place on some intelligence tests, but it isn't often used in the adult community. Names of objects are used when they are wanted or as a place to go (go to your chair) or something to buy and they can be taught better in their relevant context than in a contrived "touch spoon", "touch red", or "touch big" situation in a classroom.

Therefore, not only must the teacher and other members of the interdisciplinary team select programming domains that are relevant, but the specific activities (or objectives) within each of those domains must also have relevance of their own. A student who needs to learn how to shake can be taught, for instance, to shake a rattle, a shaker with a milkshake inside, a salt/pepper shaker, bells or other musical instruments, a rug, or a whole variety of objects. The severely handicapped student is more likely to need to know ultimately how to shake a rug out or to salt and pepper foods and shaking a rattle will be less useful over the long run. Similarly, pushing a broom might be a better skill to teach than pushing an infant push toy. Holding (grasping) spoons, brushes, combs, toothbrushes, and other similar objects, is more functional than holding bells, rattles, or mirrors. The teacher, parent, therapist, or other programmer who always thinks ahead to where the instructional objective is leading long-term will be more effective (and creative!) in developing appropriate objectives for severely handicapped students.

## MOTIVATING BEHAVIOR

One of the biggest problems which educators, parents, and other members of the interdisciplinary assessment or programming team will encounter in serving children with severe handicaps is the identification of events which will serve to motivate the child to perform behavior of increasing complexity. We feel that this problem is so significant that we have devoted an entire module to Motivating Behavior Change (Bricker & Campbell, 1982). The results of multi-factored evaluation on which the child is placed in an educational setting and on which initial programming targets are frequently based is often invalidated by the child's lack of or inconsistent motivation during evaluation. Difficulties with motivational processes also often account for discrepancies in observed performances within different settings (the child may talk at home but not at school, or may feed himself at school but refuse to at home) or with different individuals with whom the child has contact. Children who have been confined to settings with limited instructional environments (such as some residential facilities) may demonstrate motivational structures which are incompatible with those required for instruction. This phenomena has received some attention in the literature and has been referred to as "learned helplessness" by Seligman (1975). An alternative, called "learning to learn", was originally proposed by Harlow (1949) and suggests that individuals who have been restricted from learning need to acquire a general behavioral set for skill acquisition which

is not specific to acquisition of a particular skill.

Identifying Motivators

A frequent programming obstacle is the lack of information on motivational structures of the child. A teacher or other member of the interdisciplinary programming team may have difficulty identifying activities in which a low functioning child "likes" to engage, or foods which he "likes" to eat, or particular favorite toys. An initial step in identifying potentially motivating conditions is to solicit information from parents, other caretakers, previous teachers or therapists, or other individuals who have been associated with the child over a period of time. A second step is to observe the child directly in a variety of settings and activities (if possible) to generate a list of activities in which the child engages in non-structured or "free play" environment.

An important aspect of these initial two steps is that the desired outcome is a list of all possible motivators from the standpoint of the child. Judgements as to the relevance of those activities or other value judgements are not appropriate at this step. We are employing a basic rule called is/does which was formulated by Premack (1962) and states that any activity in which an individual engages for extended periods of time is potentially motivating for that individual. Within this context, behavior such as putting objects in the mouth, finger flicking, or even hitting oneself in the head is viewed as potentially motivating if the child engages in that behavior for extended periods of time.

A third step in identifying potential motivators is to selectively present the child with foods, objects, or other materials in a structured way in order to determine which of those materials will be selected most frequently by a particular child. Several approaches can be utilized by the teacher or other programmer to determine the child's preferences. The first is to present the child with several objects and to count the amount of time the child interacts with each object. Objects may be presented for a period of time in a fixed location by making a "mobile" of objects, placing the child in front of the objects, and timing the interactions. A variation of this approach is to have an individual present the child with several objects in random position, remove the objects when the child loses interest, and represent the same objects in a different position. The interactions with each object would be counted or timed for each presentation.

A more formalized approach of determining potential motivators through structured presentation is to use a two-choice paradigm so that materials are presented randomly and equally on both the right and left sides. For instance, a teacher may feel that a child may like a particular object, but may not have clear information about the motivating aspects of that object. The teacher can present the object to the child with another object to observe which object the child selects. One presentation of these two objects, however, will not produce sufficient data to determine if the object is a true potential motivator. It will be necessary for the teacher to make numerous presentations to determine if the child is selecting on the basis of

object preference or for some other reason, as well as to determine if the child will select the object over time. Position preference -- choosing the object because of the location or placement of the object rather than for the object itself -- is ruled out by presenting objects equally on the right and left sides. Repeated selection of the object over time indicates that the object is more likely to be something which the child strongly desires and is determined by presenting the object for selection at least 20 times. Multiple stimulus control procedures can also be incorporated into the two-choice paradigm in order to determine exactly which properties of the object are controlling the behavior of the child. For instance, the child may always select a piece of plastic over any other object -- not because the child "likes" plastic, but because the child "likes" the sound of the plastic when crumpled or the feel of the plastic when the object is manipulated.

All potential motivators are summarized (see Figure 4) with indications of the date the motivator was identified and a judgement of the priority of that object, activity, or behavior. The number of potentially motivating conditions known when a child enters school or a new classroom may be few, but throughout the year, the teacher or other programmers should indicate new motivating conditions as those events are identified. The teacher will be more sensitive to the child's motivational structures and may observe a greater number of potential motivators as the teacher comes to know the child and his behavioral repertoire more intimately. However, some children may be very difficult to determine potential motivators for and generally these children are those with severe movement difficulties or with low frequency of any behavior. Specific techniques to determine potential motivators are fully described in the module on Motivating Behavioral Change (Bricker & Campbell, 1982).

Over-Use of Motivators:

Known motivating conditions for a particular individual are frequently over-used in educational programming and specifically in instances with children for whom only a few motivators have been identified. Three general effects occur under conditions of over-use of motivating events. Programmers working with a particular child may be so relieved to have knowledge of one event for which a child will work that everyone involved with that child uses this one object or activity as a motivator for training a variety of skills. Therefore, a student may receive particular food pay-offs all day long or may be allowed to play with a particular toy or engage in a particular activity frequently throughout the day. The consequences once desired by the child may not be as desired if he receives them too frequently.

Use of a particular motivating condition in relation to a particular programming target over time may also not serve the best interests of the child. Behavior which is performed day-in and day-out in relation to the same consequence conditions may become rigidly a part of the child's repertoire. An illustration of this second problem in over-use of motivators is the child who has been taught to walk across the room for a glass of juice and who, after time, will only walk to obtain the juice, but will not walk to obtain a cookie, an interesting toy, or simply to get to the other side of the room. Development of rigid behavior should be avoided as the performance

of those skills under so carefully specified conditions is not truly functional.

A third problem with over-use is that of habituation or satiation. Skills which the child once performed in order to obtain a specific consequence condition may drop off and the child may no longer perform those skills. Satiation or habituation are frequent phenomena which can be alleviated through providing novel consequence conditions which maintain the child's rate of behavior over time. Multiple stimulus control procedures can be helpful in providing the degree of novelty while still retaining the interesting features that are motivating to the child.

Functional Versus Contrived Consequences:

Consequence conditions which are effective increasers of behavior with a particular child are more effective when embedded in the task which the child is required to perform. Self-feeding is an easily taught task with a child who is motivated by food as the motivating consequence, food, is embedded in the skill which the child is acquiring. Contrived consequences, although sometimes necessary, should be kept to a minimum and faded rapidly to prevent behavior from becoming performed only under contrived (rigid) conditions. Schedules of reinforcement procedures provide a means whereby contrived consequences can be faded such that the consequence condition becomes a part of the task itself. Once motivators have been identified, programming strategies which incorporate as functional motivating conditions as possible can be defined. However, with severely motor impaired, multihandicapped, low responsive, or institutionalized students, sometimes a contrived motivator may have to be initially used to simply instate behavior. Resultant programming may therefore, temporarily appear non-functional until the programmer is able to substitute a more functional consequence.

## SELECTING SPECIFIC PROGRAMMING TARGETS

The problem-oriented approach focuses on selecting programming targets for severely handicapped children by identifying those skills which the child will need to acquire in order to function within normal environments. For instance, the ultimate goal of a program which focuses on early intervention may be to move the infant into a normal preschool or kindergarten environment. Utilization of the problem-oriented approach within this context focuses on defining those skills which the child will need in order to function adequately within that normal environment. Correspondingly, a program for severely handicapped adolescents should train those skills which the student will need to seek employment or to function appropriately within a sheltered workshop. We feel that these applications of the criterion of ultimate function are directly related to selection of skills to be taught as programming targets, regardless of the age or degree of disability of the child. When the end goal of programming is determined for a particular child, the skills required by the child can be further defined. Most people would agree that an adolescent must be toilet-trained, able to feed himself, and be communicative, mobile, and manipulative in some fashion if that

Figure #4

Sample Motivator Information Record

MOTIVATOR RECORD

STUDENT'S NAME: _____

| Motivator: | Date Identified: | Use in Programming: |
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Parents' Suggestions: Toys/Objects: _____

_____

Foods: _____

Activities: _____

People: _____

Other: _____

_____

adolescent is ultimately going to be able to function within even a sheltered work situation. Definition of specific programming targets are then derived by determining behavior that the child does not currently demonstrate.

The behavior which the handicapped person needs to learn to do or needs to learn not to do is represented as the "problem" within the context specified in this manual. A totally non ambulatory child has a problem with mobility if that child is going to function within an environment where mobility is critical to ultimate functioning. Or a child who engages in self-stimulating behavior much of the time may have a problem with manipulation, as well as the simple act of engaging in self-stimulating behavior. The "problems" which each individual child has in relation to the criterion of ultimate function are classified into acceleration (needs to acquire) and deceleration (needs to learn not to do) targets.

We do not specify the use of any particular assessment or assessment/curriculum checklist as the basis for selecting programming targets as our emphasis has been on teaching the child those skills which are critical to his ultimate success as opposed to those skills which are demonstrated by normally developing children. It has been our experience that the team of individuals (teacher, parent, related services personnel) involved with a particular child can successfully bring together their areas of expertise (without elaborate tests) to identify those skills which the student needs to demonstrate. A summary sheet (see example, Figure 5) includes spaces to indicate who identified the target (knowing whether it was parent, speech specialist, occupational therapist, etc., helps evaluate the list), the date that the particular program was initiated, and the date that it was terminated. These notations are included for two reasons. First, there is only so much time in a given day and only some of the total targets that are selected for deceleration or acceleration can be managed. Consequently, if we must choose among available targets, we should pick those that have the highest priority. When a program is finally concluded, then the date terminated should be written along with some indication of degree of success. This allows for rapid review of all targets that are currently in progress, as well as those that have been managed in the past and those that remain for the future. The second factor is that date notations can begin to give us a reasonable picture of how fast this child responds to instructional routines, as well as which forms of behavior are the most difficult to change. Such records are quite useful in long-range planning for individualized instruction.

Acceleration Targets:

Acceleration targets are generally best initially described as problems with particular processes rather than as ends in themselves. Returning to a previously defined distinction may help in understanding the difference in basing programming on a structural or functional model. Saying that the child needs to learn to take one step independently is a structural description of behavior which is part of a total description of walking which may originate in "takes one step with both hands held" and end with "walks independently without falling". The structural model of programming is based

Figure #5

Sample Program Target Record

PROGRAM TARGET RECORD

DATE: _____

STUDENT'S NAME: _____ TEACHER: _____

| Instructional Need: | Type? | Who Identified? | Date Initiated | Date Terminated |
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on detailed descriptions of the steps or components of a particular end skill such as walking.

The problem-oriented approach defines behavior on the basis of a functional model. Walking may be identified as a relevant acceleration target to the extent that learning to walk is the best way in which the child can achieve the process of mobility. In other words, the critical dimension for the child is the need to become mobile (process), not the need to achieve the end skill of walking idependently (product). Focusing on a process or function basis to programming allows the interdisciplinary team to identify the most satisfactory way in which a child can be taught to acquire various critical processes, regardless of the child's primary physical or medical problems. A physically handicapped child may never walk independently without falling, but may achieve mobility through the use of selected orthopedic surgery, braces, crutches, or walker, electric wheelchair, prone scooter, crawling, scooting, or a variety of other means which can be generated and determined by the interdisciplinary team as the most effective means for the child to demonstrate mobility at a given point in time.

Acceleration targets which are critical for the child emerge from a careful analysis of the criterion of ultimate function for that child, from interdisciplinary evaluation procedures, and from discussion with the parents in relation to what outcomes they have identified as important. Frequent acceleration targets for severely handicapped children include motivation, mobility, manipulation, sensing, tonicity, imitation, consequation, social, vocal, communicative, and a host of others which directly relate to the criterion of ultimate function.

## Deceleration Targets

Deceleration targets are lists of all forms of behavior emitted by the child which are problematic to the student, his peers, to the teacher, to equipment, or potentially harmful to parents or other adults. These forms of behavior are generally the most frequently identified programming targets since behavior of this type is most annoying to those individuals associated with a child over long periods of time.

Many of the deceleration targets would be noted in the precautionary information, while others, such as teeth-grinding, fingers always in mouth, vocal screams, and other disruptive forms of behavior may not. We suggest that each and every potentially asocial, disruptive, or potentially dangerous form of behavior emitted by a given child be listed on the instructional needs survey. As new forms of behavior appear that are also bothersome, they would be added to the list.

A primary consideration in deceleraion targets is that for each one selected for programming, the teacher or parent should have a program plan for an acceleration target that replaces it. A child does not learn to behave in an undesirable way without good reason. In some cases, the child may learn forms of self-stimulation because it is more reinforcing than doing nothing all day. The child may learn to hit, kick, or bite himself to have a

parent or teacher come over to talk to him. A child may kick, bite, or hit others as a means of communicating dislike for an activity, a food, or the way that the student is being handled -- in other words, the behavior may tend to avoid situations or events that are aversive to the child. In these and other instances of undesirable behavior, there is little utility in getting rid of one form of behavior unless another that replaces its function in a more acceptable and desirable manner is taught. This point is expanded in the manual on Motivating Behavior Change (Bricker & Campbell, 1982).

A second consideration in planning is to include the parents in the plan, not only so they are fully informed about what you intend to do, but also to extend the plan into the home during those times when the child is not in school. In too many cases, the home and school are not in coordination, so that while both parents and teachers may have selected the same targets or problem areas, they are using entirely different management programs. This is an extremely inefficient approach and will do more to confuse rather than help a severely handicapped child. The parents should also help in the rating of the different targets so that the priorities represent a mutually satisfactory hierarchy. In general, the first priorities should be to eliminate forms of behavior that are hurtful to self or others, then forms that are destructive of property, and, finally, those that are undesirable, such as sucking fingers, repetitive self-stimulation, screaming, and other irritating aspects of behavior.

Maintaining Behavior:

Many types of behavior, once taught and learned, need some type of support if that behavior is not to be lost. Too often we have found children who were self-feeding solid foods only to be found a year later being fed strained foods. Children who once walked without supports are found in wheelchairs for no good reason except that the walking behavior was not maintained across classrooms. This sometimes occurs because the effort necessary to maintain a given form of behavior may be largely relative to the pay-off, so teachers and parents let the child return to a more primitive form of behavior for their own convenience.

Another problem encountered in maintaining a learned behavior over time is that of retention or memory of the processes involved. Behavior which is not practiced may be lost through deficits in short-term memory. Low functioning children can frequently be taught an isolated skill through careful programming and structuring of the task, but if that learned skill is not incorporated into another skill of greater complexity, the child will not be able to perform the skill months later in the absence of practice. Two examples may help to illustrate this point. The first involves a young lady who was taught to indicate "yes" and "no" accurately in response to questions presented in a structured communication training session. The environment in which this young lady spent much of her time was not one in which questions requiring "yes" and "no" answers were presented to her. Several months after discontinuation of the communication training sessions, she was no longer able to accurately answer questions with a "yes" and "no" response. Similar examples might be generated to account for why some children tend to lose

skills when they are absent from the education environment for several months, such as over summer vacation. The child who was expected to walk to the bathroom in school and who subsequently practiced walking several times a day may not retain the required motor patterns if he is not required to walk frequent times per day at home.

The obvious solution to maintaining behavior is to incorporate the practice of that skill into some other programming target identified as priority for the child such that more primitive forms of behavior become part of a chain leading to more complex forms of behavior. An alternative is to require practice of that skill on some pre-determined schedule in the event that the learned skill does not fit into a more complex form of behavior. This alternative of artificial practice is not ideal, but may be required within certain forms of skill acquisiton. For instance, a child is not likely to fully dress and undress himself daily in an educational situation, although he certainly should perform these skills at home or on his residential living unit on a daily basis. A teacher who wants to insure that these learned skills continue to be a part of the child's behavior repertoire may choose to check the child's skill on a once-a-week basis, either by having him dress and undress (artificial) or by insuring that he dresses and undresses on a once weekly basis in relation to a relevant activity such as participating in swimming or gym (natural). Natural incoporations of learned skills into other activities leads to behavior which becomes strengthened over time. The teacher who approaches educational programming with the criterion of ultimate function in mind and with emphasis on function will be easily able to generate programs for children which include practice.

## PROGRAMMING LEARNING ACTIVITIES

Now we are ready for the purpose of all this planning, which is to organize the materials and procedures of instruction so that both short and long-term objectives can be reached systematically. We can only introduce the topic here since the substance is found only in the act of programming specfic targets. Programming targets for the severely handicapped student are viewed as "problems" because those targets usually include forms of behavior that most children have learned at home under very casual modes of instruction. That a particular child did not learn to eat solid foods, drink from a cup, sit without support, manipulate objects with hands, walk, seek toys that are out of sight, and perform the many acts that are typical of normal children indicates the existence of a problem that can only be solved (if indeed it can) through very specialized instruction that is based on a careful analysis of the problem and some good hunches about why the child did not learn the acts earlier. The specific target continues as a "problem" until the child reaches a reasonable performance level in the specified area. When represented as a "problem", the implication is that there is a solution, even though many alternatives may have to be tried before an adequate solution is found. Dr. Ogden Lindsley of the University of Kansas has done a great deal of work with the more severely handicapped and has concluded that one of our best professional skills is to apply "Grandmother's Law" which states: "If at first you don't succeed, try, try again."

Defining Targets:

A general consideration is that all educational and therapeutic programs are based on some system of measurement that is used in both the analysis of the problem and in the determination of the extent to which the proposed program is achieving the desired results. Often, we start with subjective definitions of instructional targets. For example, if the child has a tendency to hit adults, then we would have identified a deceleration problem with the specific target of elimination of the hitting response. Subjective information would include the people who tend to be hit and situations in which hitting is a frequent form of behavior. "John tries to hit me (his teacher) every time I attempt to move him away from something that he enjoys doing and into something that I want him to do. He will continue to try and hit me as long as I continue to try to get him to do what I ask." Since a teacher would have to be a bit foolish to let the child continue to hit her, we could imagine that she is looking at "attempts", as well as "successes" (from the student's point of view)!

The next step after describing the target subjectively is to determine the measurement system that will be utilized to collect objective or baseline data. Methods for measuring behavior are described later in this module. At this point, the programmer also selects or makes up sheets on which the collected data will be recorded and designs the graph which will be used to visually represent data. The teacher might select three 10-minute periods when the student is supposed to be doing something that is called for in his educational plan and count numbers of hits or attempted hits. S/he does this for three days and then reports a baseline or objective measurement that "John either attempts or accually hits his teacher four times a minute during periods when John was supposed to be on task with an acceleration target." The teacher now has an objective assessment of the extent to which John actually hit or attempted to hit the teacher. We now also know what to expect from John and we have a measured basis for determining if our subsequent attempt to decelerate this form of behavior is working. The programming problem is now clearly defined.

At this point, several different intervention plans can be generated and proposed and indicated under alternative intervention methods. In this way, if the first plan fails to work, the teacher can shift immediately to a second and even a third prearranged plan. In addition, by considering several different plans, we might think of one later that appears to have more merit than the first plan considered. With John, we might decide to use a form of mild aversive consequence coupled with praise and a well-liked consequence if John engages in the selected acceleration targets without attempting to hit.

The example which has just been presented has involved implementing programming for a deceleration target. The same procedures -- subjective definition, objective/baseline measurement, and alternate plans -- are

utilized for all programming targets, whether those targets involve instructing a child not to engage in inappropriate behavior or teaching a child to acquire new skills. A problem with self-feeding would be defined as an acceleration target and, more precisely, by describing the target as self-feeding with a spoon. The subjective assessment might read as: "During two lunches and two dinners, Jane was given her favorite dessert in a bowl and with a spoon placed in the bowl. On all four occasions she immediately used her fingers to move the food to her mouth and did not use the spoon once, even though encouraged to do so." The objective account could then be based on a more restricted assessment in which Jane is given a single spoonful of dessert on a dish for ten presentations or opportunities. Counting each use of the spoon to the mouth and then returning the spoon to the dish (leaving the food in her mouth) as a single correct response, the number of successes in relation to total number of opportunities can be objectively measured. An objective report might read: "During four meals, Jane was given 40 opportunities to use her spoon for her dessert. She succeeded twice in the second period but did not use her spoon in any other period. Overall her percentage correct was 10%." From this account, we have the baseline information against which we can assess her progress as a function of instruction and we know that she can perform the response under highly structured and highly reinforcing conditions. The teacher can begin to formulate a plan for self-feeding that moves sequentially from desserts to all foods.

Specific Intervention Plans:

Terminology that is overly objective or behavioristic frequently makes teachers, therapists, parents, and other programmers of severely handicapped children uncomfortable. When we hear terms such as reward, reinforcement, stimulus, consequence, baseline, antecedent, and other such words, we feel uncomfortable because of the association of those terms with experimental psychology and with relatively rigid versions of behavioral psychology. Some of us feel that giving a child a reward for doing work in school or therapy is a form of bribery, is not a professional act on the part of the programmer, and is not in the long-term best interests of the child. Most of us honestly enjoy watching a child learn something simply for the sake of using the information later and not needing someone to provide a treat or to say, "You are a good child for learning that." However, during the years we haven't found very many people who were successful with the more severely handicapped using humanistic approaches and when we did, we often found them using different terms to cover their mode of interaction with the child.

The specifics of educational or therapeutic instruction include descriptions of antecedent and consequence, evaluation criteria, and desired responses from the student (Figure 6). These specifics of programming require the most precise attention if severely handicapped children are to be expected to learn from programming.

> Antecedent conditions include the setting of instruction, the materials to be used, and mode and content of the instructions that are to be given to the student, as well as such factors as

Figure #6

Sample Format for Written Instructional/Therapeutic Program

INSTRUCTIONAL/THERAPEUTIC PROGRAM PROCEDURES

STUDENT'S NAME:_____ DATE STARTED?_____

PERSON RESPONSIBLE FOR PROGRAM_____ DATE ENDED?_____

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Problem Definition:_____

Subjective Assessment of Occurrance:_____

_____

Desired Outcome from Programming:_____

Data Collection Procedures:_____

**********

Specific Instructional Procedures

Antecedent Conditions:_____

Desired Response from Student:_____

Consequence Conditions:_____

Drop Back Strategies (if student does not perform as desired):_____

_____

Evaluation Criteria:_____

Next Step After Attainment:_____

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Instructional Decision Making

Possible Antecedent Changes:_____

Possible Consequence Changes:_____

Other Potential Intervention Approaches:_____

_____

the time of day and the motivational state of the child. The term antecedent is easy to remember since it refers to all events (natural or contrived) which precede a response on the part of the child. When used in an instructional sense, antecedent refers to conditions which will be contrived by the teacher, therapist, or parent, to assist the child to demonstrate a desired form of behavior.

Consequence conditions include various forms of feedback which follow a particular response made by the child. If the consequence increases the desired response from the child, that consequence is a positive reinforcer. If the consequence decreases the response of the child immediately or fairly rapidly, it is a punishing consequence. If the response is decreased slowly, the consequnce is time-out from reinforcement or extinction. Negative reinforcement accelerates behavior through removal of an aversive stimulus following appropriate response. The point in all of this clarification is to demonstrate that potential positive or negative reinforcement, as well as punishment and time out from reinforcement can act as consequence if those conditions have the desired effect on the behavior of the child. In other words, giving a child a piece of candy for performing a predetermined behavior is not a positive consequence unless giving the child the candy increases the response level of the child in the desired manner.

Evaluation Criteria: The specific intervention for each targeted area that will be part of the child's programming at a given point in time should be described on the IEP, lesson plan, or therapy treatment plan. Antecedent conditions which are essential to the child's demonstration of the desired response are listed, as are the consequences which will follow when the child performs that desired response. The extent to which the child must perform the desired behavior before the programmer considers the target sufficiently demonstrated to be considered for programming maintenance is included under evaluation criteria. This distinction is a critical component of the problem-oriented approach, for at no time are we suggesting that the child has achieved the skill sufficiently for that skill to be dropped completely from his program plan. Rather, we are advocating the development of a plan for maintaining that behavior over time either through incorporation of simpler forms of behavior in more complex acts or through artificial probes.

Next Skill: The last component of the specific intervention plan is an indication of what behavior will be taught next or after the child has achieved the specific objective. This component is included to insure that the programmer has thought ahead and defined the direction in which programming is leading the child. The next step after attaining a specific objective of standing with support might be walking with aids (or support of some form), or might include standing without support for

short periods of time, or might include both unsupported standing and walking with aids. A child who had achieved taking the spoon to the mouth with dessert might have as a next step taking the spoon to the mouth with other foods or learning to scoop desserts or perhaps both. Definition of the next step after attainment of the targeted problem insures that the content of programming targets is functional and appropriate and that the programming provided is maximal in assisting the child to acquire those functional acts necessary to survive in society.

So far, we have considered only the basic intervention plan which will be used with a child and have described conditions in such a way that the assumpton that the child will perform as desired as a function of a well-designed program is made. In actuality, we have known many students with moderate to profound handicapping conditions who did not respond as desired, even when the programmer had carefully outlined the desired response, the antecedent, and consequence conditions. Therefore, we have tended to rely on formats that focus on strategies to be used when the desired response is not demonstrated. Flow-charts are easy-to-use representation of instructional/therapeutic strategies.

Flowcharting Instructions:

A flowchart can be a very useful tool to use to anticipate some of the aspects of instruction that do not turn out as expected and can, without preplanning, leave the teacher, therapist, aide, parent, or other programmer with no alternative approaches to drop back to if needed. In most lesson plans and IEPs, the assumption is made that the child will respond in the required manner and that all the teacher has to then do is provide the arranged consequences. We all wish that the normal teaching situation were so simple and that all children, regardless of the severity of their handicaps, would do what it is that we ask of them. However, even the newest teacher knows that this is rarely the case and even if it were, we would suspect that we might not be teaching the child anything that the child did not already know. We recommend the use of the flowchart to assist in solving one (or more) of the many "problems" encountered in providing relevant programming for severely handicapped individuals.

Communication: Teachers of multi-handicapped children frequently are expected to follow through on or carry out within the classroom specific programs established by the physical, occupational, or speech therapist, or by other specialists. The specialist may establish the objectives for the child and determine activities or methods which can be used by the teacher to assist the student to achieve the specialist-determined objectives. Sometimes the specialist provides the information to the teacher verbally so that the teacher can include these objectives in the child's individual plan or the specialist may develop a written plan for the teacher to follow. A similar situation exists when residential personnel are expected to follow programs written by specialists or when parents are given activities to use at home in instructing their handicapped children. Several problems may

occur in situations of this type. The first is that the child may not perform in the way that he did for the specialist when the specialist determined the program. For instance, the specialist may have suggested that the teacher place the child prone over a wedge in order to train head control. Perhaps the child is stiffer when the teacher places him on the wedge, and is subsequently unable to raise his head. The teacher (or aide or parent) may be carrying out the program correctly, but the expected outcome may not occur due to differences in the chid. An essentially ineffective training program may be provided to the child for the several days or weeks that elapses until the specialist re-evaluates the program. A related problem occurs when the programmer carries out an activity with a child long after the child has essentially achieved the objective or the activity has ceased to be maximally effective due to change in the behavior of the child.

A second problem is one which we refer to as "knowing the whole picture." The therapist who establishes a particular objective for a child knows not only the expected outcome in terms of increasing/decreasing a child's performance, but also the sensitive adjustments which might be required in order to insure that the training program continues to be effective. This information often is not communicated to the programmer who is left to follow directions without knowing either to what extent the child is changing or when small program adjustments should be made. A physical therapist may have as an objective for a child the decreasing of that child's hypertonicity (normalizing postural tone) and may suggest that the child be rolled slowly from side to side in order to facilitate rotation in the body axis and decrease extensor tone. The programmer may not recognize these aspects of the objective (or may not be told the purpose of the activity) and may judge the program a failure when the child does not learn to roll independently where, in fact, rolling independently was not the therapist's expected outcome.

Our experiences, both with using flowcharts ourselves and in working with teachers and other specialists who are using flowcharts, have indicated that this visual representation of the instructional process is easier to follow than either verbal or written step-by-step directions. Communication among members of the interdisciplinary team, including parents and residential care staff, is enhanced and more cohesive programming for the handicapped individual results.

Consistency: A problem which is seldom addressed in discussions of programming for severely and profoundly handicapped individuals is that of consistency in instruction. In essence, we are discussing a concept of reliability as applied to the instructional process. To what extent does an individual (teacher, parent, or therapist) provide instructional cues to the child in the same way each time the child is instructed in a particular program area? To what extent do two different individuals carry out a written program with a child in the same way? The problem of reliable programming is critical when instructing individuals with severe handicaps, since these students will acquire skills at a slower rate or may not acquire skills at all if the instruction provided is not carried out in a systematic and consistent manner.

We have observed numerous examples of lack of reliable programming and most of us can think of instances where we were inconsistent ourselves. The teacher was rushed in carrying out the child's program so the child was not positioned in the recommended piece of equipment. An object permanence task was not carried out for a week with a particular child because the substitute teacher did not have time. A child is correct on eight out of ten opportunities to put the spoon in his mouth on one day, but only correct on two out of ten opportunities on another day because the programmer on the first day gave the child significant physical guidance and the programmer on the second day expected more independent performance. One programmer gives the child reinforcement for correct performance every time the child is correct, where another programmer reinforces inconsistently or less enthusiastically than another. The therapist recommends a program where the child bears weight equally on both legs and the classroom aide who carries out the program on a daily basis judges that the child is bearing weight equally, when in fact the child is standing with weight totally on the right leg. We could cite many types of examples (and you probably can think of even more) where programming was not provided to the child in accord with a written plan in a consistent fashion. But we are not discussing so-called "sabotage" in considering the problem of reliability. Rather, we are addressing a problem that occurs in programming, even under conditions where every staff person <u>feels</u>, <u>attempts</u>, and <u>believes</u> that programming is consistent.

Flowcharting the instructional process provides one mechanism for insuring consistent programming. However, even with flowcharts, instruction can become unreliable. Analysis of the data being collected with a particular child on a particular instructional target will objectively reflect inconsistency in programming. We have found a process of staff qualification in relation to a particular target to be helpful in insuring reliability when flowcharts of the instructional process are not sufficient. Ways in which data can be objectively analyzed to identify inconsistency and methods for providing additional staff qualification are discussed later in this module.

<u>Programming Failure:</u> The typical written instructional objective states the antecedents, expected response, criteria for successful performance and sometimes the consequence events. The objective is a statement of expected outcome of instructional programming rather than a representation of the instructional process or methodology that will be used to produce the expected outcome. A flowchart of a specified instructional target is a representation of the process of instruction -- the specific procedures which will be used to teach a particular child an identified skill. Many programs designed for handicapped children fail to produce desired behavior outcomes because instruction is not provided in a systematic or sensitive enough manner. Representing the process of instruction in a flowchart format provides a diagram of the processes selected for use with the student and outlines the precise adjustments which must be made by programmers providing the instruction.

Reasons for why a particular program was not effective with a particular child (did not lead to the desired outcome) are easy to identify

after-the-fact and are remediable with some thought and analysis on the part of the teacher or other programmers. An individual who provides the same instruction for a handicapped child day after day may become somewhat "habituated" to both the instruction provided and the child's responses. "Habituation" often results in lack of precision and/or decreased sensitivity to the child's responses. Making a flowchart helps the programmer identify why the child is not making progress and generate other methods or program adjustments which need to be implemented in order to insure progress on the part of the student. A physical therapist who has recommended that a child be placed prone on a wedge to encourage head control can also communicate to the programmer that if the child does not raise his head when correctly positioned, that the programmer should then place a roll under his arms, dangle a toy above the child's head, conduct an entirely separate program for tone normalization before placing the child on the wedge, or whatever other methods the therapist would use, both systematically and as a sensitive responder to the state (and performance) of the child at a given point in time. Such a representation prevents the teacher from carefully carrying out an ineffective program and insures that the child's programming time is not wasted with inefficient and inappropriate methodology.

Communication, consistency, and programming failure are three large areas of potential programming problems where flowcharting the instructional process can be helpful in progress-oriented programming. Flowcharts describe a process to be used with a child in precise enough ways to insure that communication is maintained among members of the interdisciplinary team, programming is provided consistently, regardless of the number of programmers involved with the child, and that analyses of the process of instruction can be made in relation to desired outcome of skill acceleration or deceleration.

Flowchart Formats:

The general flowchart in Figure 7 is an illustration of one format for diagramming the instructional process. However, a point to remember is that a flowchart is developed by a programmer for use by the teacher, parent, therapist, or other individuals in order to have a predictable sequence of instructional steps. For this reason, the contents and format of the flowchart can be changed in any manner that would make it more convenient to the programmer. There is not a fixed way of writing a flowchart. Consequently, do what you wish with the format, but we do recommend strongly that some form of this specified sequence structure be used to describe the implementation plan and that particular emphasis be placed on outlining the programming adjustments which will be required when the child does not respond as expected.

A flowchart consists of several cycles of instructional activity. Each cycle must include descriptions of the antecedents (those activities that the programmer will engage in to instruct the child to respond), the expected response from the child, the consequences that will occur when the child responds, and the conditions under which the program will be continued or discontinued. The critical components of the flowchart are the secondary and tertiary cycles of instruction which specify what will be done under conditions when the child does not respond as expected. An idea of "what if the child doesn't . . . then what?" is helpful in diagraming the instructional process. In essence, the programmer describes the expected response from the child and then asks the question of "if the child does not respond as expected, then what will I do?" The "answer" to the question is defined in terms of antecedent arrangements and consequence events which comprise the secondary or tertiary cycles of the flowchart.

Flowcharting seems very burdensome and complex when a programmer initially begins to use the process for diagraming instructional programming. However, with practice, most programmers become able to quickly and easily define instruction through this system. We have included not only a general flowchart for an acceleration (Figure 7) and deceleration (Figure 8) target, but also additional examples of flowcharted instructional targets which are more specific (Figures 9, 10, and 11). These flowcharts are included as examples of methodology which was helpful in teaching specific children to perform desired instructional targets. These specific flowcharts are individualized for the children for whom those programs were designed. That is not to say that these same programs would not be effective for other children, but rather to emphasize that most flowcharts must be specifically individualized for the child or group of children who will participate in the instructional activity in order to be most effective.

Other Formats:

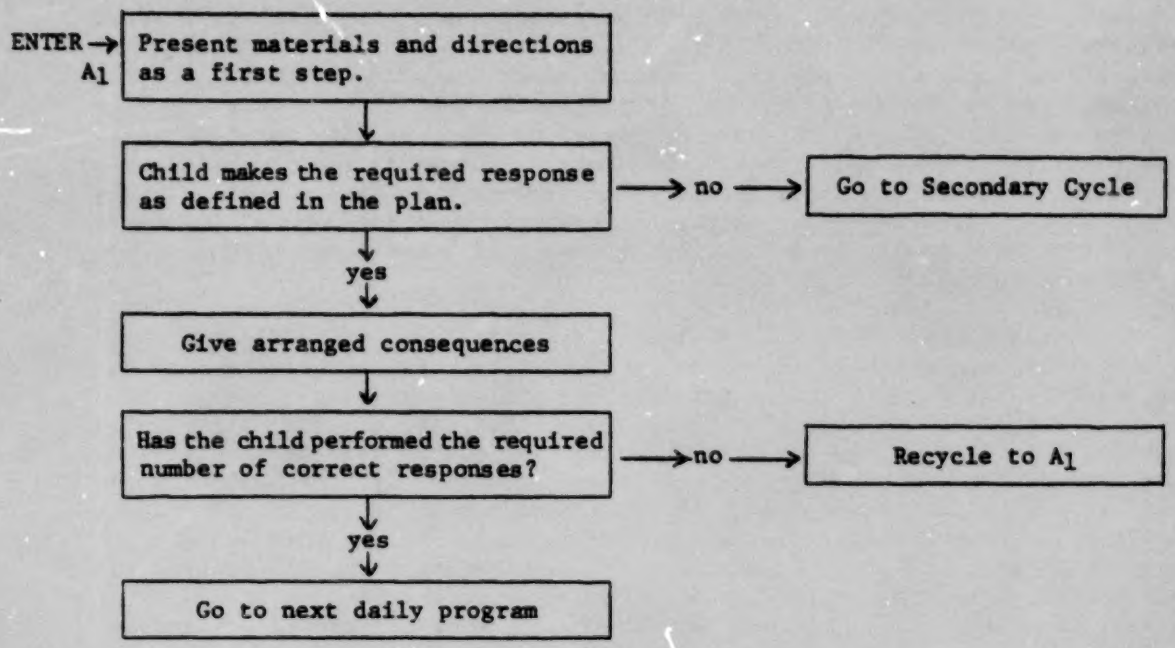
Many teachers and school districts have adopted instructional forms which represent the process of instruction (and are not just a statement of goals of objectives). These other formats can be used in place of a

Figure # 7

GENERAL FLOW-CHART FORMAT

ACCELERATION TARGET

Primary Cycle


ENTER → A1
Present materials and directions as a first step.
Child makes the required response as defined in the plan.
no
Go to Secondary Cycle
yes
Give arranged consequences
Has the child performed the required number of correct responses?
no
Recycle to A1
yes
Go to next daily program

Secondary (No) Cycle

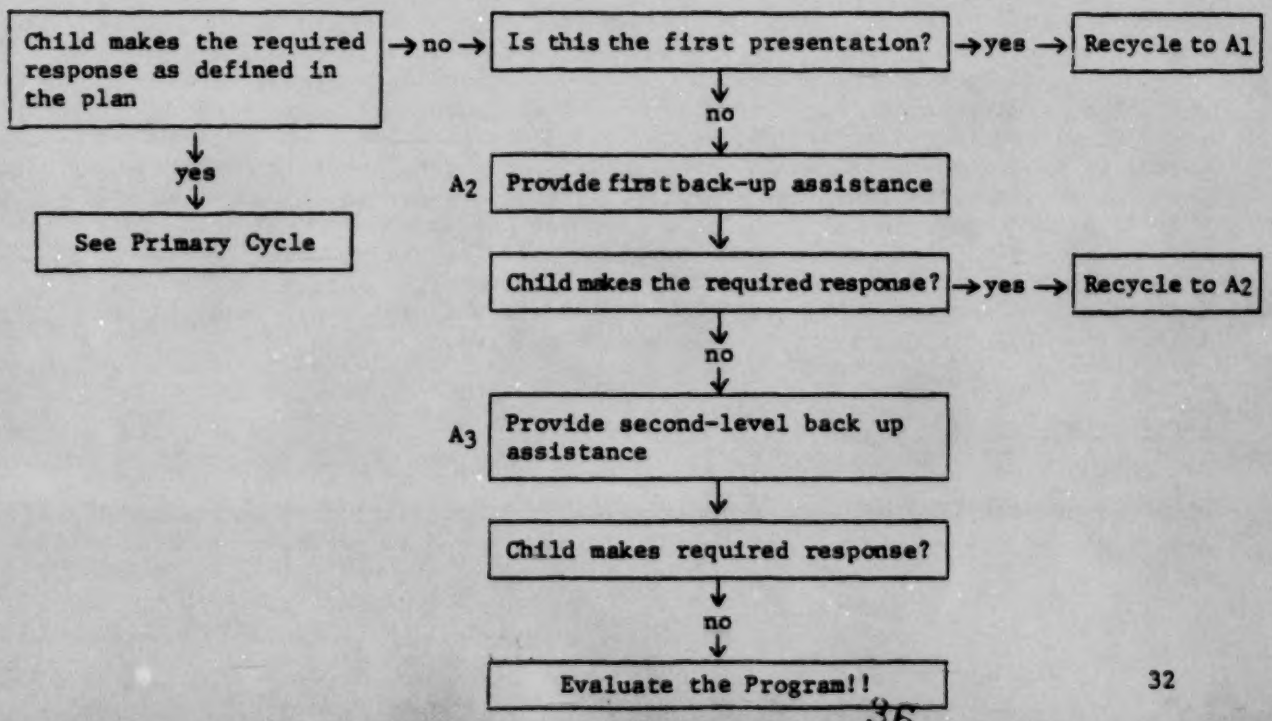
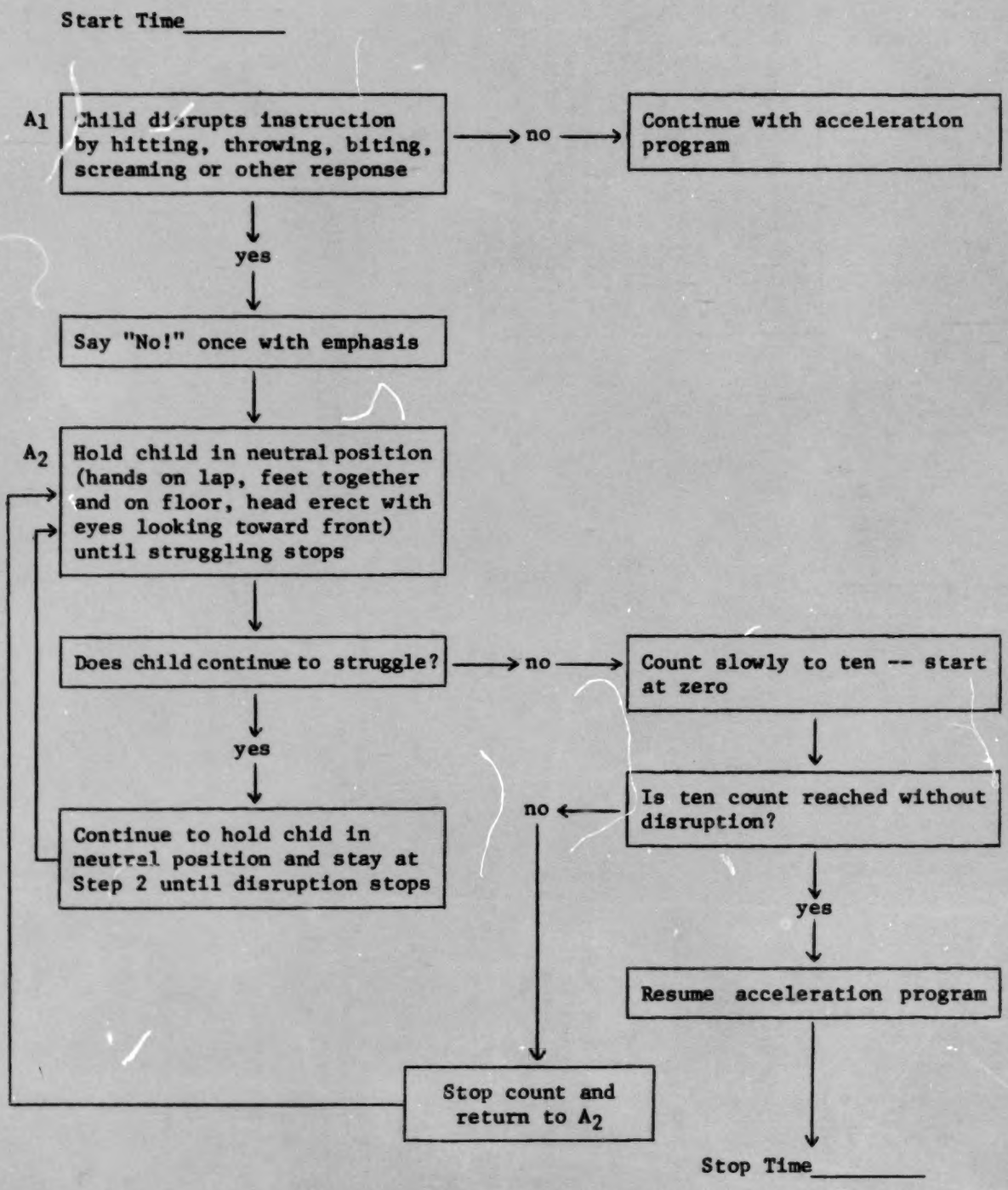


Figure #8

PERSONAL RESTRAINT

DECELERATION FLOWCHART


Start Time_____
A1
Child disrupts instruction by hitting, throwing, biting, screaming or other response
no
Continue with acceleration program
yes
Say "No!" once with emphasis
A2
Hold child in neutral position (hands on lap, feet together and on floor, head erect with eyes looking toward front) until struggling stops
Does child continue to struggle?
no
Count slowly to ten -- start at zero
yes
Is ten count reached without disruption?
no
Continue to hold chid in neutral position and stay at Step 2 until disruption stops
yes
Resume acceleration program
Stop count and return to A2
Stop Time_____

CLOTHES ON/OFF TRAINING PROCEDURE

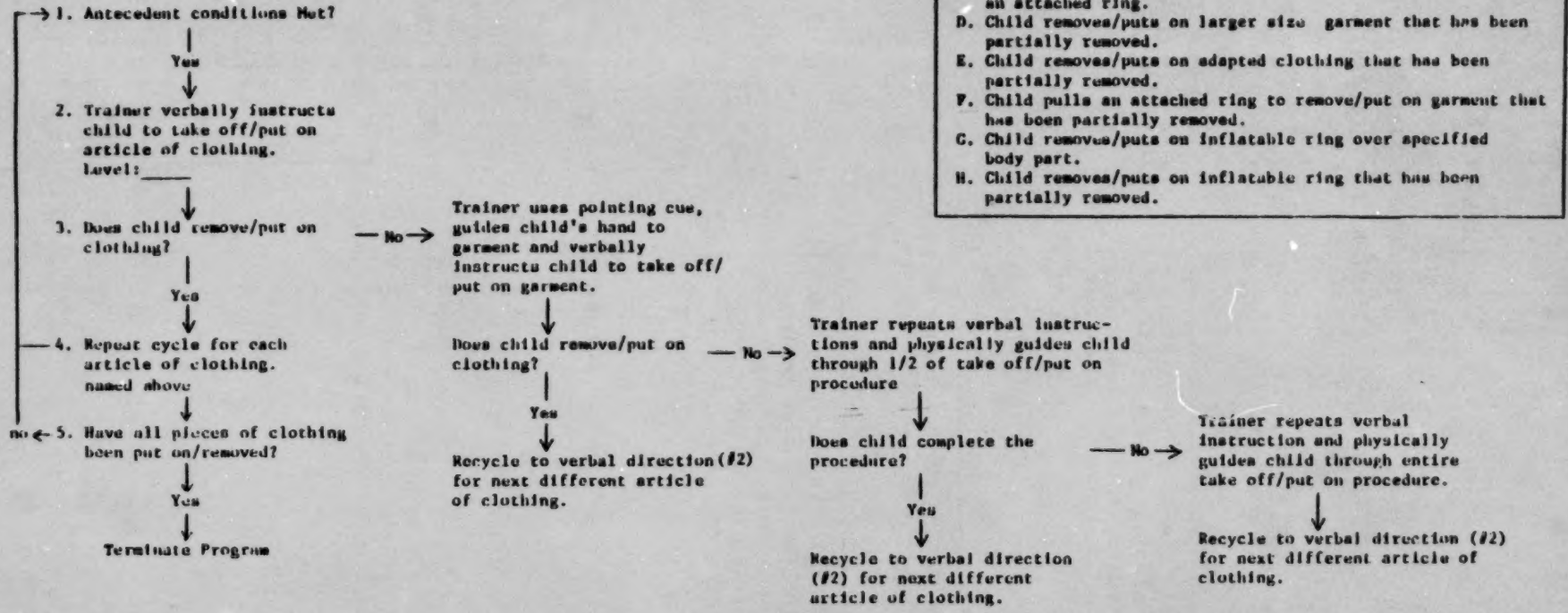
Figure #9

Name: _____

Positioning: _____

Antecedent Conditions: _____

Clothing Used: _____


1. Antecedent conditions Met?
Yes
2. Trainer verbally instructs child to take off/put on article of clothing.
Level: ____
3. Does child remove/put on clothing?
No
Trainer uses pointing cue, guides child's hand to garment and verbally instructs child to take off/put on garment.
Does child remove/put on clothing?
No
Trainer repeats verbal instructions and physically guides child through 1/2 of take off/put on procedure
Does child complete the procedure?
No
Trainer repeats verbal instruction and physically guides child through entire take off/put on procedure.
Recycle to verbal direction (#2) for next different article of clothing.
Yes
Recycle to verbal direction (#2) for next different article of clothing.
Yes
Recycle to verbal direction (#2) for next different article of clothing.
4. Repeat cycle for each article of clothing named above
no
5. Have all pieces of clothing been put on/removed?
Yes
Terminate Program

**LEVELS**

A. Child independently removes/puts on garment that is a larger size.
B. Child independently removes/puts on piece of adapted clothing.
C. Child independently removes/puts on garment by pulling an attached ring.
D. Child removes/puts on larger size garment that has been partially removed.
E. Child removes/puts on adapted clothing that has been partially removed.
F. Child pulls an attached ring to remove/put on garment that has been partially removed.
G. Child removes/puts on inflatable ring over specified body part.
H. Child removes/puts on inflatable ring that has been partially removed.

Figure #10

EYE POINT TRAINING PROCEDURE

Child's Name: _____

Date Initiated: _____

Required Response: An eye point is considered to occur if the child's eyes make visual contact (fixation) with the grid section in which the named stimuli is presented for 3 seconds; within 15 seconds of verbal antecedent.

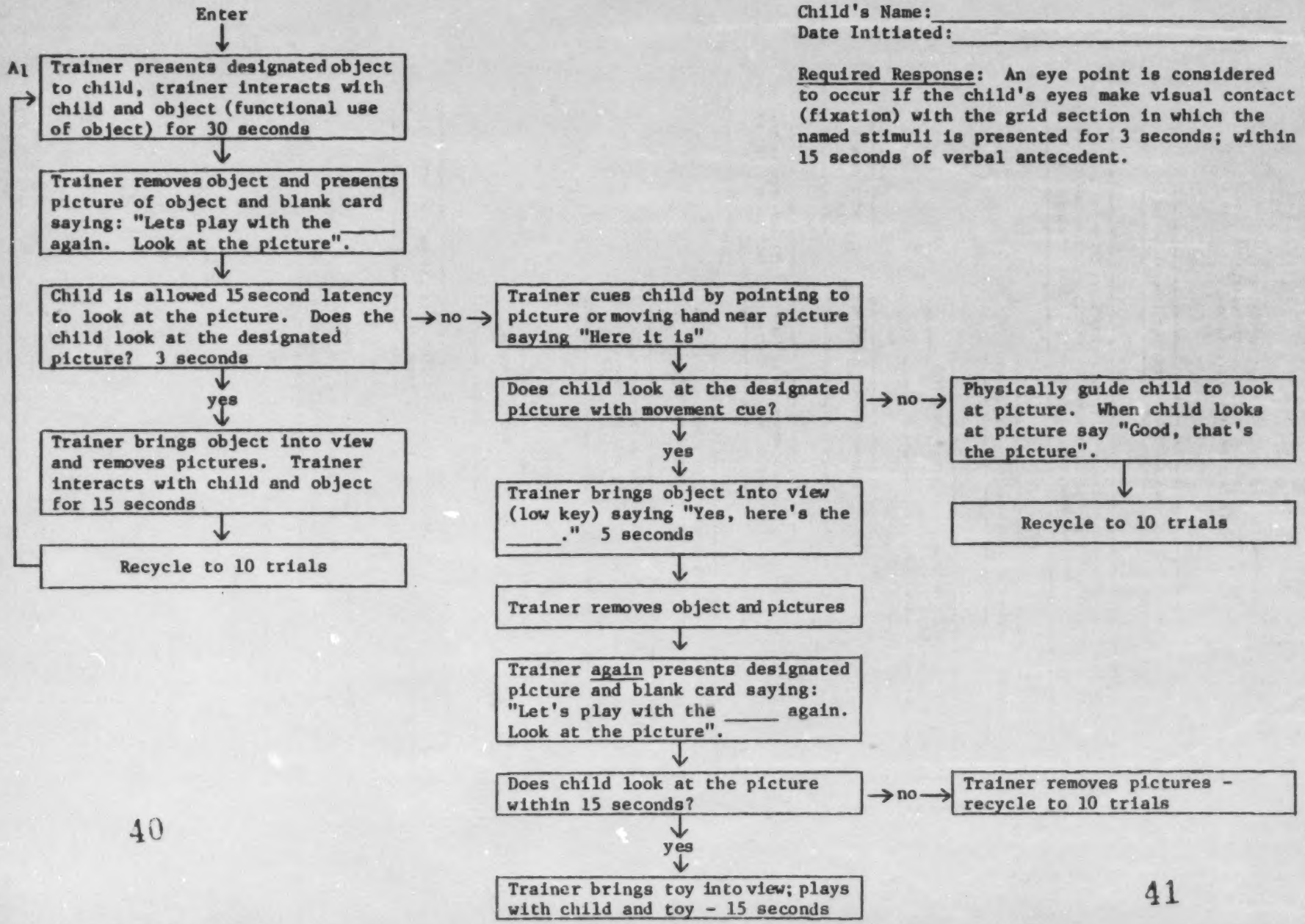
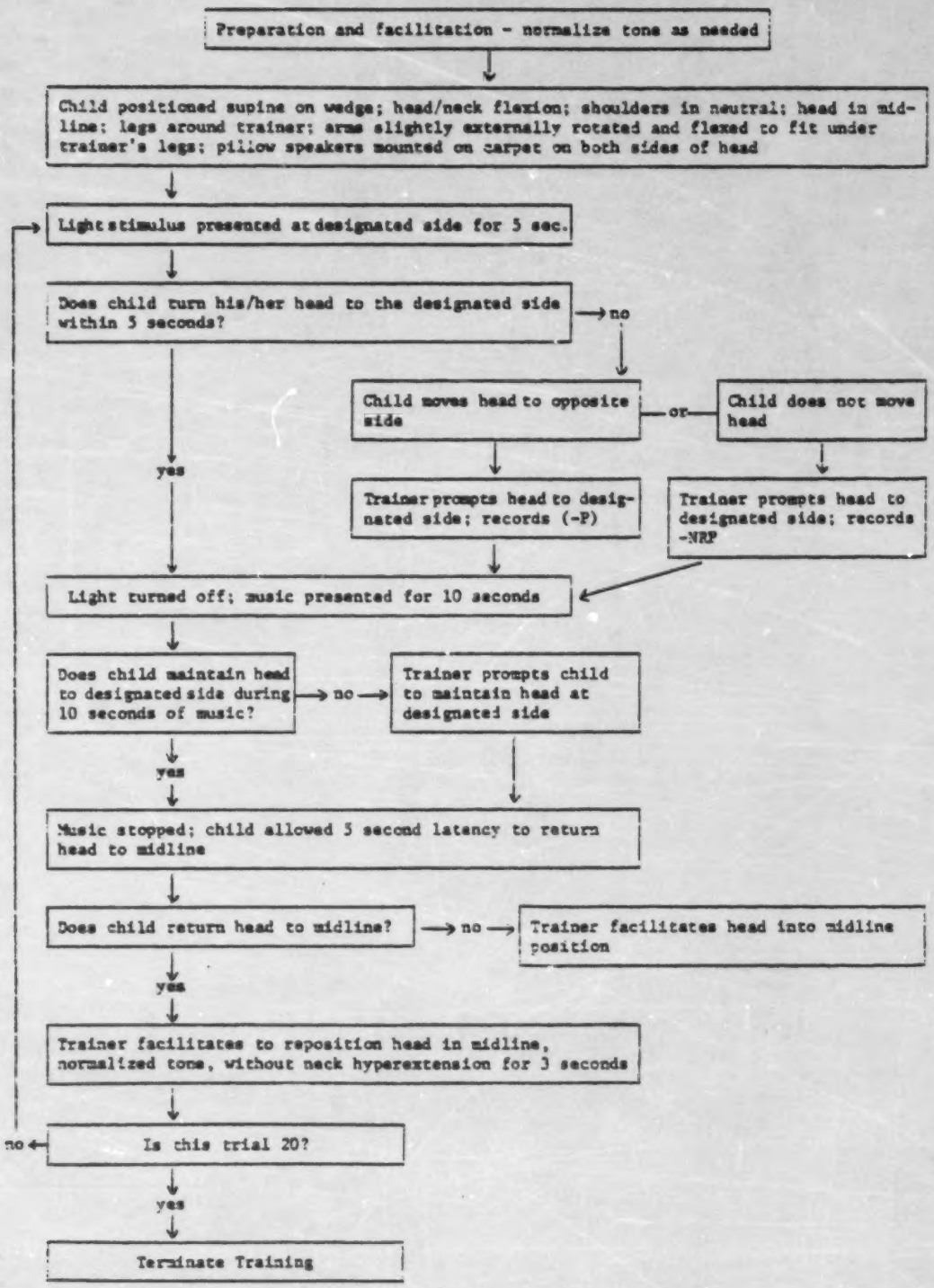

Enter
A1
Trainer presents designated object to child, trainer interacts with child and object (functional use of object) for 30 seconds
Trainer removes object and presents picture of object and blank card saying: "Lets play with the _____ again. Look at the picture".
Child is allowed 15 second latency to look at the picture. Does the child look at the designated picture? 3 seconds
no
Trainer cues child by pointing to picture or moving hand near picture saying "Here it is"
Does child look at the designated picture with movement cue?
no
Physically guide child to look at picture. When child looks at picture say "Good, that's the picture".
Recycle to 10 trials
yes
Trainer brings object into view (low key) saying "Yes, here's the _____." 5 seconds
yes
Trainer brings object into view and removes pictures. Trainer interacts with child and object for 15 seconds
Recycle to 10 trials
Trainer removes object and pictures
Trainer again presents designated picture and blank card saying: "Let's play with the _____ again. Look at the picture".
Does child look at the picture within 15 seconds?
no
Trainer removes pictures - recycle to 10 trials
yes
Trainer brings toy into view; plays with child and toy - 15 seconds

Figure #11

Baseline Procedures for Random Position
Head Turn Contingency with Ligh Antecedent and
Music Reinforcer (Consequence)


Preparation and facilitation - normalize tone as needed
Child positioned supine on wedge; head/neck flexion; shoulders in neutral; head in midline; legs around trainer; arms slightly externally rotated and flexed to fit under trainer's legs; pillow speakers mounted on carpet on both sides of head
Light stimulus presented at designated side for 5 sec.
Does child turn his/her head to the designated side within 5 seconds?
no
yes
Child moves head to opposite side
or
Child does not move head
Trainer prompts head to designated side; records (-P)
Trainer prompts head to designated side; records -NRP
Light turned off; music presented for 10 seconds
Does child maintain head to designated side during 10 seconds of music?
no
Trainer prompts child to maintain head at designated side
yes
Music stopped; child allowed 5 second latency to return head to midline
Does child return head to midline?
no
Trainer facilitates head into midline position
yes
Trainer facilitates to reposition head in midline, normalized tone, without neck hyperextension for 3 seconds
Is this trial 20?
no
yes
Terminate Training

flow-chart. Figure 6 (in this module) presents one example that is often effective without completing a flowchart. Figure 12 shows a format that was used and recommended by the Pennsylvania Training Model (Somerton & Turner, 1975). However, there are many other appropriate formats in which instructional objectives can be represented. The key factor to remember about the flowchartiong and about representing instructional objectives in general is that strategies that will enable the student to perform if the originally selected strategies are ineffective should be pre-planned and determined prior to instruction. Objectives such as the following don't provide this type of information: "Given positioning in the adaptive chair and two pictures (one of a cow and one of milk), Bobby will select the picture of milk 90% of the time for three consecutive days." The teacher/programmer is left "defenseless" if the student does not select the picture of milk under the established conditions.

## TEST-TEACH SYSTEM

In most programs for handicapped students, the teacher or members of the instructional team typically form learning goals and objectives on the basis of formalized assessment (Bricker & Campbell, 1980). However, these goals and objectives can only be accurate to the extent that the initial testing and the procedures themselves are accurate measurements of the student's strengths and weaknesses in relation to relevant long-term instructional needs. Few instruments currently exist which measure a student's performance in terms of long term outcomes. Rather, most instruments measure student performance against a standard of "normal" (Campbell, in press) which may be inappropriate for the student who does not hear, or see, or even move well. In addition, instructional sequences implied or directly stated in the instrumnt may be inappropriate or inefficient sequences to use with severely handicapped students.

An alternative to planning programming on the basis of standardized or criterion-referenced tests is to use a system such as the Index of Qualification for Specialized Services (Campbell & Bricker, 1982) which screens student's to determine areas of needed intervention. The teacher or therapist can then use a test-teach approach (Bricker, 1976) to identify the most effective instructional methodology to use in teaching a student a selected goal. The test-teach system is based on collecting systematic data regarding a student's performance under a variety of conditions such that the programmer determines not whether or not the student can perform a desired skill (as in present/absent measurements) but rather the extent to which the student can be taught to perform by manipulation of antecedent and consequence events. Thus, a measurement (or judgement) of rate of learning and statements of conditions under which learning occurs are more significant than whether or not the student performed the skill under conditions specified by an assessment instrument/procedures.

Many different forms of the same behavior function can be selected to be taught to severely handicapped students. For instance, a teacher may judge that motor imitation is an important skill for a student to acquire for the purpose of being able to perform on the basis of demonstration alone (e.g.,

Figure #12

INDIVIDUAL PRESCRIPTIVE PLANNING SHEET

| Antecedents (Given) | | Behavior | | Consequences | | Criteria | Comments |
|---|---|---|---|---|---|---|---|
| Preparation | Procedures | Correct | Error | Correct | Error | | |
| | | | | | | | |

to learn to sign using the hands/arms without having to be physically guided to replicate the sign system). However, the teacher may not know whethegr to begin instruction with motor imitation items that also involve an object (such as in imitation of beating a drum), are visible to the student (e.g., clap hands), or are invisible to the student (e.g., blink of eyes). Using a test-teach system, the teacher could construct a series of items using a top-down approach where attempts were made to first teach invisible imitations (theoretically the most difficult), then back down to visible and object-centered imitations, if the student did not demonstrate invisible imitations. Similarly, many instructional programs involve the use of pictures or objects. A test-teach system might first try teaching pointing to or looking at named items represented as black and white drawings (receptive language) and back down to colored pictures, photographs, or the object themselves.

The purpose of using a test-teach system is to provide efficient instruction and to prevent instructional programs which teach students skills that are already known. When a bottom-up approach to instruction is used (as is represented on most assessments that follow normal child developmental sequences), students may spend time in irrelevant instruction and/or learning activities that may not be necessary later. If, for instance, non-verbal forms of communication are the desired outcome and that communication will require pictorial representations of some sort, the student may not need to first learn to point to objects before learning to point to pictures. Similarly, if walking with braces and crutches is the long-term mobility goal, the student may not need to be able to demonstrate efficient crawling before learning to walk. Using a test-teach system helps the teacher (and other programmers) to identify the most relevant forms of desired behavior as well as the competence level of the student.

## STRONG INFERENCE TESTING

Strong inference testing simply involves the formulation of a hypothesis (or assumption) about why an instructional program may not be working and/or about what procedures may be most effective to use to instruct a student to perform a desired skill. The general tendency of many people who program for severely handicapped students is to find something, anything, that will work!! We often find that we have changed so many aspects of a particular instructional task at the same time that if the student does acquire a new behavior, we have no idea of what instruction "caused" the student to learn the new skill. Strong inference testing (Bricker, 1976; Campbell, 1981) provides a systematic alternative. Strong inference testing also provides a mechanism for attempting to isolate reasons why a student might not be acquiring a particular skill when programming efforts are not successful.

Most teachers and programmers perform strong inference testing as part of their ongoing interaction with students. However, the conclusions reached are often substantiated by opinion or subjective data rather than is lated through objective data. Implementing strong inference requires that teachers, parents, and other programmers involved with a particular student follow these simple "steps":

1. List all possible reasons why a program procedure may not be effective. Such reasons can range from clinical judgements such as medication changes to subjective opinions about behavior or motivation (such as boredom, lack of cooperation, etc.).

2. Identify approaches where each of the possible reasons (hypotheses) can be proven incorrect. This step would be comparable to testing the null hypothesis in more formal research designs. The emphasis must be on proving the reason incorrect rather than on proving the assumption correct. Most of us are quite good at accumulating data that proves our position correct (while often simultaneously ignoring relevant data that might invalidate our position!).

3. Evaluate objective data collected relative to all possible assumptions (hypotheses) to isolate those factors (variables) that are having the greatest impact on the instructional process.

4. Revise programming procedures to allow for those critical factors.

In essence, strong inference is very similar to the system used in medicine for diagnosis that is labeled as differential diagnosis. The physician who is using differential diagnosis procedures makes several "guesses" about what disease or disorder may be affecting the patient. S/he then orders the necessary laboratory and other tests to provide critical objective data and conducts examinations that will look for evidence that does not support the presence of a particular disease process. The objective data from both tests and examination is then reviewed and other medical specialists may be brought into the review to determine if additional data should be collected or additional examinations conducted. Finally, the physician (or team of physicians) reviews all data and makes a diagnosis of the medical problem -- often through determining what the patient does not have. In educational and clinical settings, we typically use the beginning process but seldom conduct the necessary "tests" that might prove a position incorrect. We determine that the child is fussy on a particular day while simultaneously deciding that maybe s/he hasn't had the correct medication or that s/he got up too early that morning or is hungry or is cold, etc. However, often we also decide that the student must be hungry -- even though we don't know what time feeding occurred that morning or other information that might substantiate (or not substantiate) that conclusion. In most instances, we can't ask the infant, young child, or non-verbal severely handicapped student to validate our position and probably we don't have access to parents and residential care aides who may have the critical information -- so, we simply conclude.

Several examples of use of strong inference procedures have been provided in other sources (e.g., Bricker & Campbell, 1980; Campbell, 1982).

However, one further example may be helpful here. This example involves a severely motorically handicapped six year old who was known to have normal auditory acuity but limited visual field ranges with diminished visual acuity. Christopher demonstrated no voluntary movement at all of either the arms, legs, or head and, in fact, did not show voluntary movement of the eye musculature. Postural tone was hypotonic (low) much of the time but fluctuated to hypertonicity under conditions of stimulation. Therefore, postural tone was increased (hypertonic) much of the time. The head was maintained to the right side the majority of the time with a position of extreme right cervical rotation in combination with neck hyperextension, referred to clinically as asymmetry to the right. Vision in the left eye was better than that on the right (and head position may well have been maintained more because of visual orientation than postural tone problems). An evaluation of this student's movement abilities indicated in addition to the absence of movement generally and the postural tone atypicality, limited strength in the muscles that would rotate the head to the left. Chris was able to move his head from the midline to the left (gravity assisting) but was not able to then move his head back to midline (anti-gravity movement) or to use the neck flexor muscles to bring his chin toward his chest. One motivator that was determined was music. A paradigm was then established whereby Chris would receive music when he turned his head to the left side but would not receive music when he turned his head to the right (Figure #13). The data in Figure #14 shows that, in fact, head turning to the left increased.

The next step in this program was to attempt to bring the head turning responses (both right and left) under the control of some instructional direction/cue (antecedent). An instructional event of a bright light was used to indicate to Chris whether he needed to turn to the right or to the left in order to receive music. If the light on Chris's right was turned on, the music would be contingent on a right head turn where if the light on the left was turned on, the music would be contingent on left head turning. The data in Figure #15 indicates that behavior fluctuated under these conditions. Various assumptions were made about why the behavior was so inconsistent -- primary among which was an assumption that perhaps the light was not a sufficient visual stimulus. The end process of the assumption-testing demonstrated that even through the light was planfully used as the cue, that Chris was responding to a cue of movement of the fingers. When movement of the fingers was used on either the right or the left (with or without the light), data indicated that performance was appropriate.

Any programmer might question both the feasibility and the value of conducting strong inference procedures in a situation such as this. However, information that "moving fingers" constitute a reasonable instructional cue can be used by a teacher or other programmers across situations with a given student and time won't be wasted trying to cue a student with a light. The movement cue, with Chris, was incorporated into other instructional programs such as visual tracking/scanning, looking at a named object/picture, and other activities, as well as by the classroom teacher who could cue Chris to turn his head to the right or left with moving fingers (in combination with simple verbal direction) during classroom activities. Eventually, the movement cue was systematically faded to bring head turning (controlling head

Figure #5

Head Turn Contingency Intervention

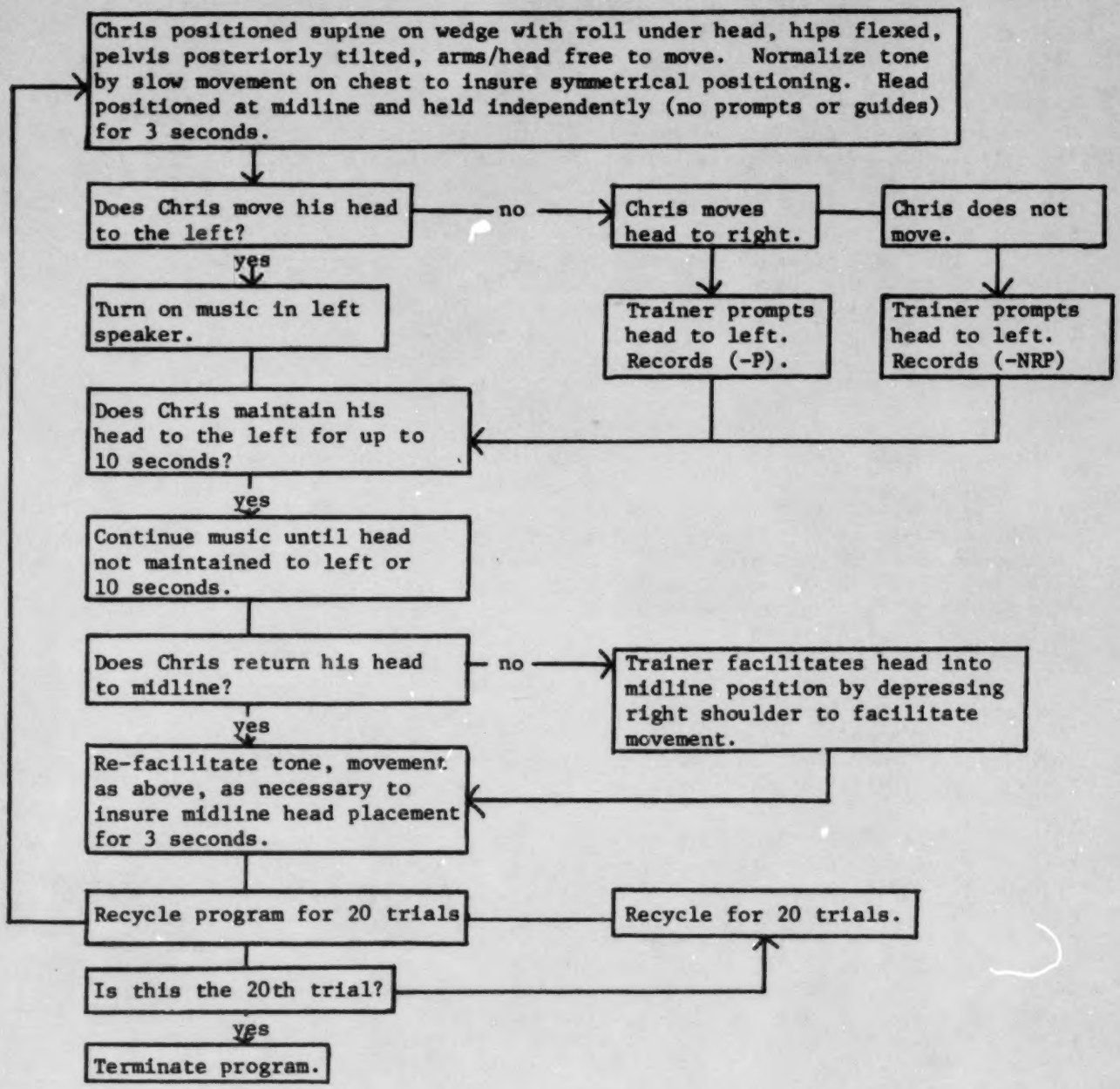
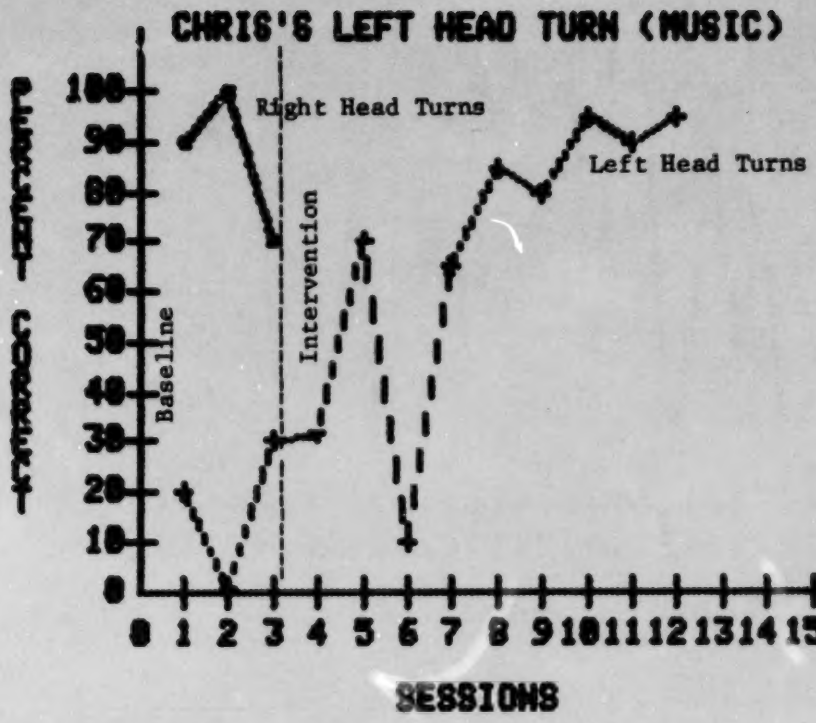
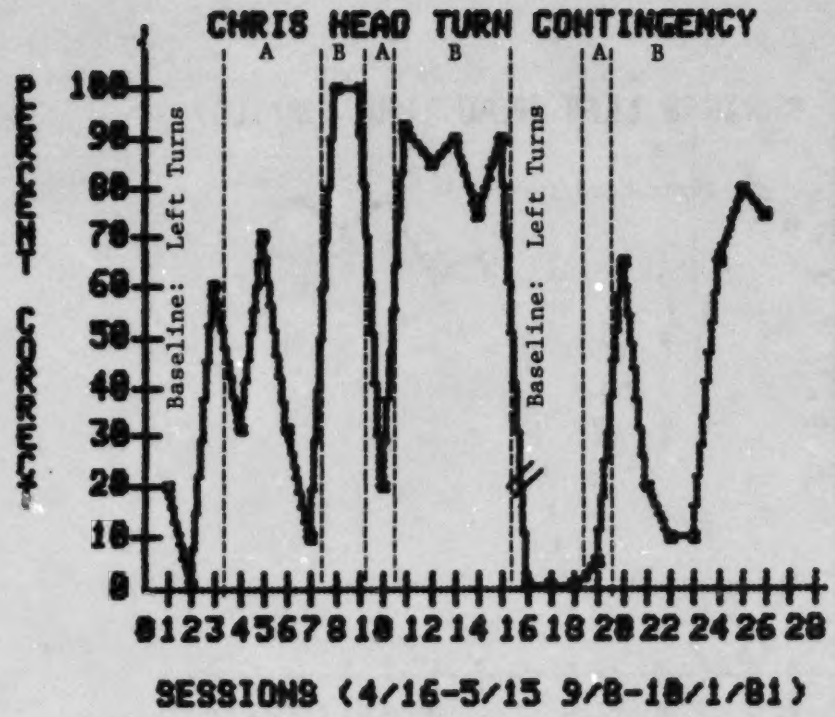

Chris positioned supine on wedge with roll under head, hips flexed, pelvis posteriorly tilted, arms/head free to move. Normalize tone by slow movement on chest to insure symmetrical positioning. Head positioned at midline and held independently (no prompts or guides) for 3 seconds.
Does Chris move his head to the left?
no
Chris moves head to right.
Chris does not move.
yes
Turn on music in left speaker.
Trainer prompts head to left. Records (-P).
Trainer prompts head to left. Records (-NRP)
Does Chris maintain his head to the left for up to 10 seconds?
yes
Continue music until head not maintained to left or 10 seconds.
Does Chris return his head to midline?
no
Trainer facilitates head into midline position by depressing right shoulder to facilitate movement.
yes
Re-facilitate tone, movement as above, as necessary to insure midline head placement for 3 seconds.
Recycle program for 20 trials
Recycle for 20 trials.
Is this the 20th trial?
yes
Terminate program.

Figure #14


CHRIS'S LEFT HEAD TURN (MUSIC)
Right Head Turns
Left Head Turns
Intervention
Baseline
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
SESSIONS

Graph showing increase in left head turns with Music contingent to left turns, absent for right head turns.

Figure #15




Graph showing differences between Training A and Training B: Training A included a light antecedent cue with music as a reinforcer for correct turns; Training B included a light antecedent with a movement cue in front of the light with music as a reinforcer. Student's performance was under the control of the movement cue (and not the light antecedent).

// = 3 month absence in training.

movement) under the control of environmental antecedents rather than movement.

## DATA BASED DECISION MAKING

Throughout this manual, we have emphasized the importance of objective data as a means of determining the most effective programming strategies utilized with given students. However, data-based decision making, although unfortunately not widely used in educational situations, has been heavily used in business, industry, and other situations. In fact, most of us use data-based decision making in our everyday lives -- even in such simple activities as checking consumer reports before purchasing a major appliance or looking at mileage ratings and repair records before buying a new car.

A number of educators have suggested methods for structuring classroom programming on the basis of data collection and have generated curriculum based on an instructional model that regularly evaluates objective data (see, for instance, the Teaching Research A data based classroom for the moderately and severely handicapped, Fredericks and others, 1979). Other authors have also reported various ways to collect data on performances of severely handicapped students, as well as to make accurate programming decisions on the basis of that data (Haring, Liberty, & White, 1980; Guess and others, 1976; Snell & Smith, 1978; White & Haring, 1976). Data collection methods are being written about more frequently since severely handicapped students are no longer excluded from public education programs. Keeping appraised of what is happening in the area of data collection is important since more effective ways of managing data collection systems are being reported.

Obviously, in order to use objective data as the basis for educational decision making, data not only has to be collected but also has to be regularly reviewed. Many times, teachers and other professionals collect data but don't look at the results and/or base programming on subjective interpretations of success rather than on the results of the data itself. To regularly review data seems like a fairly obvious and easy task. However, for the teacher with 8-10 students in a classroom or the therapist who is responsible for as many as 20-30 children, regularly reviewing and graphing data can be a time-consuming process.

### Representing Data:

There are two basic approaches that can be used for making data both easy to collect and to monitor. One is to use a data sheet that will function as a recorder of data, a summary sheet, and a graph. The most commonly used of these data sheets is one designed by Saunders and Koplik (1975) which is outlined in Figure 16. This type of sheet is best used for instructional targets that are limited to ten trials where correct/incorrect responses are being recorded. The sheet cannot be used as well with unequal trials or if correct/incorrect responses are not being recorded. Sometimes

## MASTERY TEST DATA SHEET

CHILD:_____ TEACHER:_____

INITIATED:_____ TERMINATED:_____ % DAYS IN PROGRAM:_____ % DAYS ABSENT:_____

OBJECTIVE #'s:_____ _____ _____ _____

TEST DATE: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

| OBJECTIVE:_____ | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| _____ | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| _____ | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| _____ | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| _____ | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| _____ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| _____ | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| _____ | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| _____ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

other measurements such as rate, percent correct/incorrect (unequal trials), or trials to criterion are better used. Or a teacher might want to record such items as distance that are also not easily represented on these sheets. In addition, some instructional paradigms (such as two-choice discrimination, Figure #17) are also easier to implement without using this sheet to record and graph simultaneously. However, whenever the instructional situation requires only correct/incorrect response, using this data sheet can save a great deal of time.

Another way to insure efficiency when collecting and reviewing data is to use a data summary sheet. Graphing can then be done directly from the summary sheet rather than from the raw data. Several people have experimented with ways to make summarizing data easy and efficient. One way that has been helpful for many people is to use a color coding system with a summary sheet of all programs being implemented with students (Figure #18) where one color, for instance green, would be used to code a program where the student had performed to criterion; another color, red, would be used for programs where performance was not to criterion; and a third color, black, would indicate that the program had not been implemented that day (even though the student was in school). Absences would be recorded by "A" and notations made about reasons for absences on the bottom of the page. The advantages to this format are that data across all programs implemented with a given student can be reviewed at a glance. The teacher/programmers can determine which programs have been omitted the most frequently, how many absences from school the student has had, and which instructional programs should be reviewed in greater depth (either because the student has not met criterion frequently and/or has met criterion many days in a row). However, this representational format also has significant disadvantages in that progess toward a goal is not represented. Student performance is recorded essentially as (+) -- met criterion, or (-) -- did not meet criterion. Changes in instructional strategies leading toward attainment of the same goal must be represented as an entirely new program. For instance, if a teacher decided to use objects for a naming program rather than pictures, the change would have to be written out as a new program. Individual data sheets must still be used and maintained when this summary system is utilized in order to provide the back-up data on child performance and to utilize in programmatic decision making.

Another type of summary sheet can be used either by itself or in combination with the summary sheet described above (Figure #19). This sheet summarizes a greater amount of information on child performance but does so on a program-by-program basis. Therefore, summary sheets for all instructional or therapeutic programs being implemented with a student must be simultaneously reviewed and/or further summarized onto the summary sheet described above. The advantages of this summary sheet are that data can easily be transferred from the sheet onto a visual representation of child performance (such as a line graph or bar chart), strategy changes can be indicated in the comment column without completely rewriting the instructional program, and additional columns can be easily added to record other relevant information. Subjective information about student performance (e.g., "really liked the cookies that we made", "seemed bored today", or "was very congested") can easily be noted under comments, providing the reviewer

Figure #17

## BASIC TWO CHOICE DISCRIMINATION TASK

Time Start:_____ Time End:_____

Trainer:_____

Child's Name:_____

Required Response:_____

Antecedent Arrangements:_____

Consequence:_____

| | L | R | +/- | | L | R | +/- |
|---|---|---|---|---|---|---|---|
| 1. | * | | | 21. | * | | |
| 2. | | * | | 22. | | * | |
| 3. | * | | | 23. | * | | |
| 4. | * | | | 24. | * | | |
| 5. | * | | | 25. | * | | |
| 6. | | * | | 26. | | * | |
| 7. | * | | | 27. | * | | |
| 8. | | * | | 28. | | * | |
| 9. | * | | | 29. | * | | |
| 10. | | * | | 30. | | * | |
| 11. | | * | | 31. | | * | |
| 12. | * | | | 32. | * | | |
| 13. | * | | | 33. | * | | |
| 14. | | * | | 34. | | * | |
| 15. | | * | | 35. | | * | |
| 16. | * | | | 36. | * | | |
| 17. | | * | | 37. | | * | |
| 18. | * | | | 38. | * | | |
| 19. | | * | | 39. | | * | |
| 20. | | * | | 40. | | * | |

Figure #18

DATA SUMMARY SHEET

Name:_____ D.O.B.:__/__/__ Age:_____ Teacher:_____

| Programs | Dates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

X (green) = met criterion established for instructional program
Y (red) = did not meet criterion established for instructional program
O (black) = student in school but program not implemented

Figure #19

DATA SUMMARY SHEET

Specific Program:_____ Child's Name:_____

| Date | Data Point | Trainer Init. | Observe. Time | # Trials | | # Correct | | % Correct | | Rate Resp | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | R | L | R | L | R | L | R | L | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | |

with important information needed to accurately interpret data.

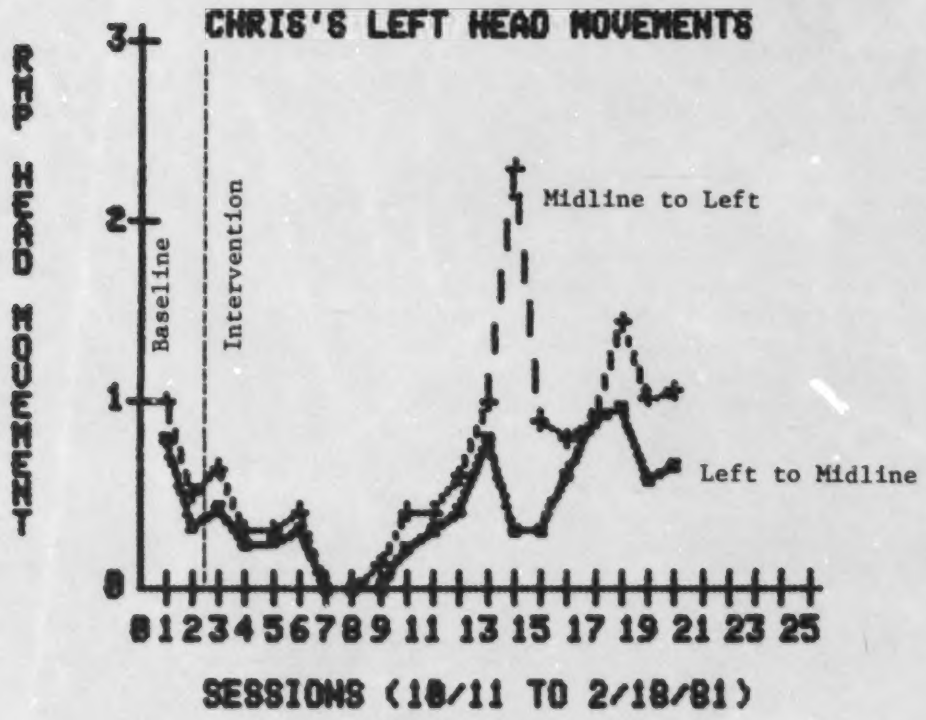
All instructional and therapeutic program data will not be able to be fully collected and summarized on the examples of data and summary sheets presented in this module. However, teachers and therapists can make up their own sheets in order to insure ease and efficiency for collecting and maintaining data records. Recording data on bits of paper and/or whatever is convenient at the moment does not help the teacher in the long run because each of those scraps are easily lost and important information may not be recorded. A "formal" data sheet insures that dates, exact responses, and other significant aspects related to programming will be efficiently maintained. Appendix A in this module includes examples of data sheets, as well as blank forms for copying, and additional data sheets related to assessing motivators are included in Motivating Behavior Change (Bricker & Campbell, 1982).

Graphs of one sort or another are the most common way of representing data visually and many materials have been written and developed to assist teachers and other programmers to graph data (e.g., Snell & Smith, 1978; MacLeod, Andrews, & Grove, 1980; White & Haring, 1976). The most typically used graph is a line graph, although the same data may be represented in a variety of ways (Figures 20 and 21). Line graphs, however, are easiest for most people to understand and to use as the basis for programmatic decision making. In general, most graphs include a baseline on an intervention phase. However, the baseline phase may, in practice, be a representation of the initial intervention attempted with the student (White & Liberty, 1976). In a single A-B program design (i.e., one target, baseline-instructon), the initial baseline/intervention phase must include a minimum of 3 data points in order to successfully interpret the data. This phase is separated on the graph from the intervention (or second intervention) phase with a line which can also be used to separate successive interventions generated from instructional strategy changes (Figure 22). This allows the teacher/programmer to maintain a "running" graph of performance in relation to a targeted goal without having to re-do graphs each time a program change is made. When data is not represented on a self-graphing data sheet (such as the one previously suggested), data should be transferred from the summary sheet to a graph at least every week. Graphing can be an extraordinary and time consuming task that is made more complicated (and aversive!!) if not kept up with.

Decision Making:

Traditionally, most programmatic decisions have been based on visual inspection/interpretation of data represented on graphs rather than through statistical analyses. However, little has been written regarding specific rules to use in interpreting data for decision making purposes (Haring, Liberty, & White, 1980). The most general rule has suggested an evaluation of data points over a 3-7 session period (Baldwin, 1976; Fredericks and others, 1979; Haring & White, 1976) with indication that changes should be made if student behavior is not changing, is decreasing, or shows extreme variability. The most typical change suggested, however, has been to drop back to an easier skill level.

Figure #20

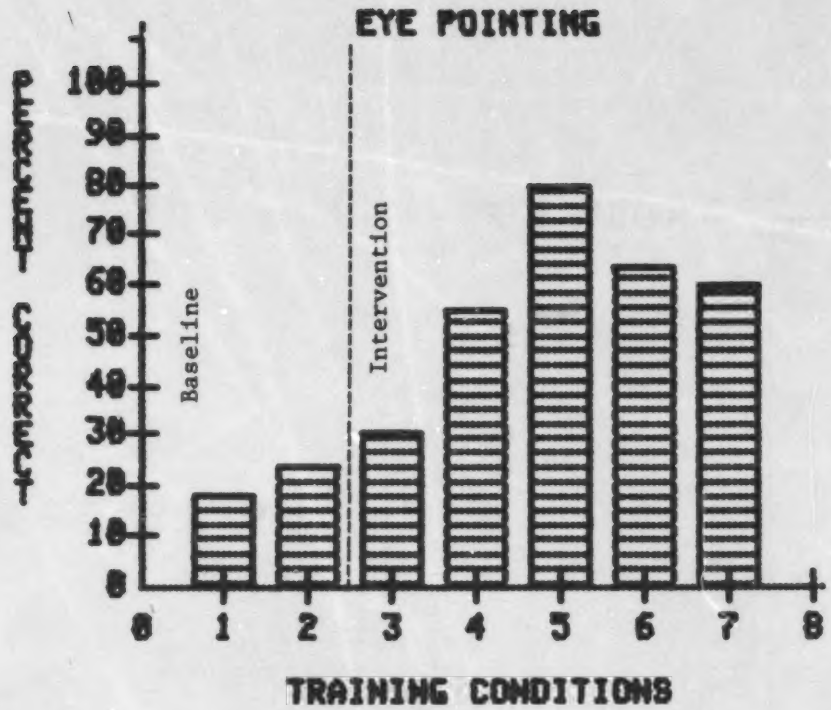



Line graph showing head movements from midline to the left and from left to midline.

Figure #21

Bar graph showing head movements from midline to the left and from left to midline.

Figure #22




Condition 1: Baseline/Black and White Pictures

Condition 2: Baseline/Preferred Object Pictures

Condition 3: Training: Object picture paired with blank Distractor

Condition 4: Training: Cue correct picture with movement

Condition 5: Training: Use smile face picture with movement cue

Condition 6: Training: Use smile face picture without cue

Condition 7: Training: Use picture of mom without cue

Some initial attempts have been made by Haring, Liberty, and White (1980) to define the conditions (or learning patterns) that are most successfully influenced by specific manipulations of instructional strategies. In general, 26 learning patterns were identified and have been labeled by the strategy change that is most likely to produce behavior change including manipulation of: antecedents; consequences; antecedents and consequences together; compliance; and task requirements. In addition, five of the 26 learning patterns have been classified as likely to show continued positive change without any manipulation of instructional strategies. Teachers and programmers have been taught to develop learning patterns for their students using specific graphing procedures, to compare those patterns with the 26 identified patterns, and to make the recommended alteration in instructional strategies.

The following change guidelines can be derived from analysis of both correct responses and error responses in instructional activities that allow for at least 10 learning opportunities (trials) for each instructional encounter over a period of 5-7 sessions:

1. Where error responses exceed correct responses and where both error responses and correct responses are increasing, correct responses are decreasing, or when correct responses are increasing with no change should provide the student with more information on how to perform (antecedent changes).

2. Where correct responses exceed incorrect responses and where correct responses are either stable (no change) or decreasing, the instructional strategy change should change to motivate the student (consequence changes).

3. Where error responses and correct responses remain at 0 (no corrects) with increasing error responses, the instructional strategy change should be to drop back to an easier prerequisite skill or component skill level.

4. Where correct responses exceed error responses but show considerable variability with decreasing or stable error responses, compliance problems are present. Such patterns typically appear across all instructional programs of a given student and require specific compliance training procedures for behavior change.

Guidelines about program strategy decision making derived from the Teaching Research materials as well as from individual investigations of learning within specific curricular areas, typically have suggested program change by dropping back or accelerating to the next step in the task analysis (Fredericks and others, 1979). This system may be appropriate for some students but is probably least likely to produce change in programming with profoundly handicapped or multi-handicapped children where more careful analyses of performance are required in order to determine precise

instructional changes (Campbell, 1982).

Programming Alternatives:

Three basic approaches can be utilized when a specified instructional plan fails with a given student. However, the vast majority of instructional programs that are implemented with severely handicapped students appear to fail because of weak, inappropriate, or unmotivating consequences for correct performance. Many of the tasks that are appropriate to teach severely handicapped students are not motivating in and of themselves and for many students, may be more unmotivating than the alternative. For instance, why should dressing oneself (particularly if the task is difficult) be more rewarding than being dressed by another person? In other words, independence (for the sake of independence alone) may not be a very strong motivator for many severely handicapped students. This situation leads us to a first programming "rule":

> Re-evaluate the consequence arrangements of the instructional task first before modifying other task aspects and before selecting another instructional strategy.

Errors in programming that are made in relation to application of consequences frequently include: inconsistent provision of consequences (causing an unintentional intermittent schedule of reinforcement); provision of consequences which are no longer motivating (e.g., giving a student liquid when the student is not thirsty); or providing the same consequence again and again across all instructional tasks (causing the consequence to become non-motivating).

The second aspect to be considered is often the first area of change made by teachers and other programmers. All of us have a natural tendency to increase the number of verbal directions and to provide more cues and prompts under conditions where the student does not respond to instruction. If we ask the student to do something and he does not immediately respond, many programmers will repeat verbal directions several times or provide the students with "hints" by adding in additional cues and prompts. A teacher may ask the student to get his coat and put it on so that she/he can go home on the bus. When the student does not respond after several verbal "reminders", the teacher may get the coat for the student. When the student still does not put on the coat, the teacher may "skip" guidance completely and simply put the coat on the child. The student, in this situation, may have received as many as 20-30 instructional directions -- but still did not ever exhibit the correct response. Situations like these can be frequently observed in classrooms for severely handicapped students which leads us to a second programming "rule" which is:

> Systematically re-evaluate the antecedent arrangements of the task in such a way that the student is provided only with the

sufficient and necessary type of instruction that will enable correct (desired) response.

The final "rule" to consider in altering an unsuccessful program relates to whether or not the desired behavior outcome is possible for the student. A program should be re-evaluated as "not possible" for the student only after the programmer is sure that motivation has been high and that antecedents have been appropiate. Such a statement is far easier to make than to implement -- particularly with those severely handicapped students who may have movement disorders or sensory impairment. Judgements that the student "has plateaued" or "is not yet ready" or other similar statements should not be made until motivators are known and have been tested and antecedent arrangements have been systematically varied, leading to the final "rule" to:

Consider an alternative of modifying the response expected from the student only after all possible consequences and antecedent arrangements have been tested.

## CLASSROOM AND PROGRAM ORGANIZATION

So far in this module, we have addressed programming for severely handicapped students in relation to individual student needs. However, at some point, the teacher and other individuals involved with each student must organize programming for an entire group of students. As most teachers know, classroom organization is easier discussed than efficiently implemented since so many severely handicapped students, particularly those with multiple impairments, are difficult to instruct in group situations. However, several suggestions/guidelines may be helpful:

1. Organize program information and data on a student-by-student basis in program notebooks, files, card files, or on clipboards that are maintained in the same location.

2. Review all information on all students briefly at the end of each classroom day to be sure that all information is in the correct location and that information from data collection sheets has been recorded on summary sheets and graphs.

3. Set aside time at the beginning or end of the school day to review each student's program on approximately a once per week basis. Changes to be made in instructional strategies should be indicated on the summary sheet and program sheets/flowcharts for implementation. Keep lists of needed instructional materials to insure that ordering

or location occurs before program changes requiring these materials are attempted.

4. Organize materials needed for each instructional activity for each student or group of students by keeping materials in the same location (and close to where the instruction will take place), assembling them in boxes, envelopes, or other containers or organizational means. Keep data sheets for the activity with the materials or in notebooks or files, whichever is most convenient. Check materials at the end or beginning of each school day to insure that all program materials are complete. This "checking" will prevent needing to hunt for required materials or to write data on scrap paper.

5. Make a schedule of activities that will occur for each student or groups of students during the classroom day. Different schedules for different days may need to be made if staffing or programming changes on a day by day basis (e.g., speech therapist comes in on Monday afternoons, etc.; volunteer works Tuesday mornings).

6. Tap as many resources as possible to provide extra staff that may be necessary for one-on-one programming. Parents, volunteers, practicum and student teachers, foster grandparents, etc. are all resources for obtaining extra programming personnel. However, these people should be used efficiently -- not just as "extras". Not only can time from these people be helpful in programming, but can also be useful in making instructional materials, copying data sheets, recording data on summary sheets, and updating tasks.

## SUMMARY

The challenge of educating the severely handicapped student is clear to those working in the field. However, the strategies and procedures that will change the behavior of every severely handicapped student in ways that will enable as independent and productive functioning as possible are often clear!! We have tried in this module to describe a series of activities that can be used by teachers, programmers, and parents to identify relevant instructional targets, implement effective intervention strategies, and, overall, produce positive change in the behavior of severely handicapped learners.

The problem-oriented approach focuses on developing the unique and individual "solutions" that are necessary to enable each severely handicapped student to acquire functional skills. Many of the "solutions" to the problems of educating these students are available through following the

assessment-programming procedures outlined in this manual (as well as in other materials). However, many "solutions" remain to be created and validated by professionals and parents involved with severely handicapped children. We hope that by following the guidelines contained in this manual that you will not only be more effecitve with students in your classroom, but will also have a basis from which you can develop your own creative solutions to instructional problems encountered with your students!

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# APPENDIX A

## SAMPLE DATA SHEETS

## FEEDING

Child's Name: _____ Date: _____

Trainer: _____

| Trial | Number of Bites | Duration | Trial | Number of Bites | Duration |
|---|---|---|---|---|---|
| 1 | | | 21 | | |
| 2 | | | 22 | | |
| 3 | | | 23 | | |
| 4 | | | 24 | | |
| 5 | | | 25 | | |
| 6 | | | 26 | | |
| 7 | | | 27 | | |
| 8 | | | 28 | | |
| 9 | | | 29 | | |
| 10 | | | 30 | | |
| 11 | | | 31 | | |
| 12 | | | 32 | | |
| 13 | | | 33 | | |
| 14 | | | 34 | | |
| 15 | | | 35 | | |
| 16 | | | 36 | | |
| 17 | | | 37 | | |
| 18 | | | 38 | | |
| 19 | | | 39 | | |
| 20 | | | 40 | | |

FEEDING

Child:_____ Date:_____

Trainer:_____

| TRIAL | INDEP. GRASP | SCOOP | INDEP. SCOOP | INDEP. TO MOUTH | MAINTAINS FOOD IN MOUTH | INDEP. BOWL |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |

SYSTEMATIC SEARCH FOR HIDDEN OBJECTS

Name:_____ Date:_____

Trainer:_____

| TRIAL | POSITION | STIMULUS | BOX | OPEN +/- | SEARCH L-R +/- | AUD. CUE | TACT/AUD CUE | MAINTAIN R HAND |
|---|---|---|---|---|---|---|---|---|
| 1 | 3 | | | | | | | |
| 2 | 1 | | | | | | | |
| 3 | 2 | | | | | | | |
| 4 | 3 | | | | | | | |
| 5 | 1 | | | | | | | |
| 6 | 1 | | | | | | | |
| 7 | 2 | | | | | | | |
| 8 | 1 | | | | | | | |
| 9 | 3 | | | | | | | |
| 10 | 2 | | | | | | | |
| 11 | 3 | | | | | | | |
| 12 | 2 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| TOTALS | | | | /12 | /12 | | | |

STATE:

COMMENTS:



2/82

## SWITCH ACTIVATION

### BASELINE

Child's Name: _____ Date: _____

Trainer: _____ SR+= _____

| Trial | Frequency/ 3 Minute Trial | Rate/Minute | Comments |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

$\bar{X}$ RPM = _____

## SWITCH ACTIVATION

Child's Name:_____ Date:_____

Trainer:_____

| Trial | +/-/NR | Latency |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |

BARREL SWITCH - DISCRIMINATIVE PERFORMANCE

Child's Name:_____ Date:_____

Trainer:_____

Positioning:

$SR^+$ (music):

Live Switch: With Tactile Cue and Auditory $SR^+$

Dead Switch: Without Tactile Cue and No Auditory $SR^+$

| TRIAL | LEFT | RIGHT | FREQUENCY/ 3-MINUTE TRIALS | RATE/MIN. | COMMENTS |
|---|---|---|---|---|---|
| 1 | live* | | | | |
| 2 | live* | | | | |
| 3 | | dead* | | | |
| 4 | dead* | | | | |
| 5 | | live* | | | |
| 6 | | live* | | | |
| 7 | dead* | | | | |
| 8 | live* | | | | |
| 9 | | dead* | | | |
| 10 | | dead* | | | |
| 11 | dead* | | | | |
| 12 | | live* | | | |
| 13 | live* | | | | |
| 14 | | live* | | | |
| 15 | dead* | | | | |
| 16 | | dead* | | | |
| TOTALS: | | | | $\bar{x}$: | |

$\bar{x}$ RPM with tactile cue and auditory $SR^+$ (live):

$\bar{x}$ RPM without tactile cue and no $SR^+$ (dead):

## HEAD TURN DATA SHEET

Child's Name:_____ Date:_____

Trainer:_____

Required Response:_____

| TRIAL | DIRECTION OF HEAD TURN L/R | SR+ (+/-) | COMMENTS |
|---|---|---|---|
| 1 | | | Time Start: |
| 2 | | | Time Stop: |
| 3 | | | Volume/Tone: |
| 4 | | | Selection: |
| 5 | | | End Counter: |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |
| 22 | | | |
| 23 | | | |
| 24 | | | |
| 25 | | | |
| 26 | | | |
| 27 | | | |
| 28 | | | |
| 29 | | | |
| 30 | | | |
| 31 | | | |
| 32 | | | |
| 33 | | | |
| 34 | | | |
| 35 | | | |
| 36 | | | |
| 37 | | | |
| 38 | | | |
| 39 | | | |
| 40 | | | |

## EYE POINT TRAINING

Child's Name: _____ Time Start: _____

Trainer: _____ Time End: _____

Required Response: _____

Antecedent Arrangements: _____

Consequences: _____

| Trial | L | R | +/- | +/- Movement Cue | +/- Second Presentation |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

## CRAWLER DATA SHEET

Child's Name:_____ Date:_____

Trainer:_____

| Trial | Right Hip Flexion | Left Hip Flexion | Inches/5 Minutes |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

Totals: $\bar{X}$ R hip flexion: _____

$\bar{X}$ L hip flexion: _____

$\bar{X}$ inches/5 minutes:_____

# IMITATION FORM

Name: _____

Target Behavior: _____

Behavior Definition: _____

Intervention: _____

Code: P = prompt
G = guidance

| BEHAVIOR | + | − |
|---|---|---|
| 1. Clap hands | | |
| 2. Wave hand | | |
| 3. Hands on head | | |
| 4. Hit hand to knee | | |
| 5. Hit stick on table | | |
| 6. Hit 2 hands on table | | |
| 7. Nod head | | |
| 8. Mouth open | | |
| 9. Tongue out | | |
| 10. Tongue on teeth | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## MASTERY TEST DATA SHEET

CHILD:_____ TEACHER:_____

INITIATED:_____ TERMINATED:_____ % DAYS IN PROGRAM:_____ % DAYS ABSENT:_____

OBJECTIVE #'s:_____ _____ _____ _____

TEST DATE: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

| OBJECTIVE:_____ | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| _____ | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| _____ | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| _____ | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| _____ | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| _____ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| _____ | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| _____ | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| _____ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## BASIC TWO CHOICE DISCRIMINATION TASK

Time Start:_____ Time End:_____

Trainer:_____

Child's Name:_____

Required Response:_____

Antecedent Arrangements:_____

Consequence:_____

| | L | R | +/- | | L | R | +/- |
|---|---|---|---|---|---|---|---|
| 1. | * | | | 21. | * | | |
| 2. | | * | | 22. | | * | |
| 3. | * | | | 23. | * | | |
| 4. | * | | | 24. | * | | |
| 5. | * | | | 25. | * | | |
| 6. | | * | | 26. | | * | |
| 7. | * | | | 27. | * | | |
| 8. | | * | | 28. | | * | |
| 9. | * | | | 29. | * | | |
| 10. | | * | | 30. | | * | |
| 11. | | * | | 31. | | * | |
| 12. | * | | | 32. | * | | |
| 13. | * | | | 33. | * | | |
| 14. | | * | | 34. | | * | |
| 15. | | * | | 35. | | * | |
| 16. | * | | | 36. | * | | |
| 17. | | * | | 37. | | * | |
| 18. | * | | | 38. | * | | |
| 19. | | * | | 39. | | * | |
| 20. | | * | | 40. | | * | |

## BASIC TWO CHOICE DISCRIMINATION TASK

Time Start:_____ Time End:_____

Trainer:_____

Child's Name:_____

Required Response:_____

Antecedent Arrangements:_____

Consequence:_____

| | L | R | +/- | | L | R | +/- |
|---|---|---|---|---|---|---|---|
| 1. | *ball | hat | | 21. | *ball | hat | |
| 2. | doll | *cup | | 22. | doll | *cup | |
| 3. | *book | spoon | | 23. | *book | spoon | |
| 4. | *phone | cookie | | 24. | *phone | cookie | |
| 5. | *block | truck | | 25. | *block | truck | |
| 6. | cup | *ball | | 26. | cup | *ball | |
| 7. | *hat | doll | | 27. | *hat | doll | |
| 8. | truck | *book | | 28. | truck | *book | |
| 9. | *spoon | phone | | 29. | *spoon | phone | |
| 10. | cookie | *doll | | 30. | cookie | *doll | |
| 11. | book | *block | | 31. | book | *block | |
| 12. | *truck | ball | | 32. | *truck | ball | |
| 13. | *cup | book | | 33. | *cup | book | |
| 14. | phone | *hat | | 34. | phone | *hat | |
| 15. | spoon | *cookie | | 35. | spoon | *cookie | |
| 16. | *doll | cup | | 36. | *doll | cup | |
| 17. | ball | *truck | | 37. | ball | *truck | |
| 18. | *cookie | block | | 38. | *cookie | block | |
| 19. | hat | *phone | | 39. | hat | *phone | |
| 20. | block | *spoon | | 40. | block | *spoon | |

Name: _____

Date: _____

Program: _____

Required Response or Step: _____

| Trials | +/- Independent | Prompt/Guide | Comments |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |

TOTALS: Total Independent: _____/% _____

Total Prompt/Guide: _____/% _____

## DATA SUMMARY SHEET

Specific Program:_____ Child's Name:_____

| Date | Data Point | Trainer Init. | Observe. Time | # Trials | | # Correct | | % Correct | | Rate Resp | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | R | L | R | L | R | L | R | L | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | |

DATA SUMMARY SHEET

Name: _____ D.O.B.: / / Age: _____ Teacher: _____

| Programs | Dates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

X (green) = met criterion established for instructional program
Y (red) = did not meet criterion established for instructional program
O (black) = student in school but program not implemented